Government of Ghana

Ministry of Local Government and Rural Development

ENVIRONMENTAL HEALTH AND SANITATION DIRECTORATE

National Environmental Sanitation Strategy and Action Plan

NESSAP

Materials in Transition

March 2010

The proportion of Waste Electrical and Electronic Equipment (WEEE) and plastic wastes is increasing and constitute a source of major nuisance that affects the amenity of communities. There is great potential for job creation through improved handling of these components.

Biodegradable Organic Fraction (BOF) constitutes the largest proportion of solid waste. It has great potential for compost production and creation of jobs while minimizing pollution of the environment from poor disposal of refuse. MINTing this portion is significant in meeting MDGs.

Wastewater is used in urban agriculture and depending on the season, it supports 47 -162 ha of vegetable production and up to 800 ha of Maize in Accra. Many residents rely on this source of "greens".

Uncontrolled discharge of septage and faecal sludges is polluting our beaches, rivers and water courses – a main cause of cholera and typhoid outbreak. Decentralised Treatment, Re-use and Recovery (DETERR) systems will provide on-plot treatment and yield biogas. Solving these will improve tourism along beaches and the coast.

A large number of people - more than 20,000 households of which 5,200 are in Accra alone - rely on banned pan latrines..Close to 5.2 million people will have to be provided with improved household facilities from 2010 till 2015.

In Ghana there is a heavy reliance on open drains for sullage and 'grey' water conveyance. Poor Solid Waste Management makes the maintenance of these drains more difficult

Materials in Transition = MINT. *MINTing* is the underlying philosophy for creating awareness for change of attitude towards the handling and disposal of all types of waste by demonstrating that there is value in all the components of wastes.

MINTing will create 'green collar' jobs and has the potential to reduce MMDAs' cost for waste management.

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Preface

1. The National Environmental Sanitation Strategy and Action Plan (NESSAP), *Materials in Transition* (MINT*) is a forward looking document. MINT* is about raising awareness for changing the sanitation-behaviour of people by changing attitudes towards all types of wastes as life-styles and waste streams undergo inevitable change. MINTing when effectively implemented will create 'green collar' jobs and has the potential to reduce MMDAs' cost for waste management

2. The NESSAP is a response to the need to refocus attention on environmental sanitation in Ghana and provide clear strategies and action plans that will guide implementation by Metropolitan, Municipal and District Assemblies (MMDAs). It is a logical follow-up to the revision of the Environmental Sanitation Policy (1999) within the new framework of national planning that requires comprehensive sector policies and strategic plans and investment costs.

3. The NESSAP also addresses Government of Ghana's (GoG's) response to emerging national and international agenda. The Human Development Report 2006 (HDR 2006)[1] prepared by the United Nations Development Programme which focused on water and sanitation, re-iterated a number of proposals that national governments were required to follow to put sanitation on track and achieve the MDG 7 "Ensure environmental sustainability".

4. The HDR 2006 urged that countries focus on *national policies and political leadership in bringing sanitation to centre stage, enabling effective public participation, deliberately targeting the un-served poor, pooling resources through effective aid and donor partnerships*, and removing the barriers to sanitation progress, especially those of gender and poverty.

5. Subsequent to the launch of the HDR 2006, the UN General Assembly in December of 2006, declared 2008 as the International Year of Sanitation (IYS). During the launch of the IYS in New York on the 21st of November 2007, The Prince of Orange, HRH Prince Willem-Alexander of The Netherlands, Chairperson, UN Secretary General's Advisory Board on Water and Sanitation, reiterated further the need to mobilise "*ALL for sanitation*" including politicians, communities, particularly women's groups, to change sanitation and hygiene practices through campaigns on sanitation and health education in order to achieve "*Sanitation for ALL*". The current Sanitation and Water for ALL: A Global Framework for Action (SWA) is partly in response to this call.

6. The Ghana Country Economic Memorandum (CEM), 2007, also draws attention to the impact of poor environmental sanitation on other service sectors especially the food and hospitality industry, and the consequence on tourism, a major source of foreign exchange earnings for the country.

7. The NESSAP covers all components of environmental sanitation. It addresses some of the concerns raised by the *Global Monitoring Report 2008*[2], issued by the World Bank and IMF in April 2008. The report indicated then that at halfway point in the effort to achieving the MDGs, many developing countries including Ghana were challenged by environmental issues that would detract from the gains in all fronts. The central message of the Global Monitoring Report (2008) urges for more consideration to

[1] The Human Development Report 2006 **Beyond Scarcity**: Power, poverty and the global water crisis, UNDP, 2006.
[2] The Global Monitoring Report, 2008 - *MDGs and the Environment, Agenda for Inclusive and Sustainable Development*, IBRD/World Bank, Washington DC 2008.

environment dimensions of sanitation including looking out for the effects of poor environmental sanitation on the pollution of water sources and contribution to carbon emissions and thus global warming.

8. The need to consider environmental sanitation broadly as part of national development agenda is also secured by the current Medium-Term Development Policy Framework (MTDPF, 2010 – 2013). The main environmental strategies of the MTDPF address a number of the key issues including establishment of an environmental sanitation investment fund.

9. Since 2004 the Ministry of Local Government and Rural Development (MLGRD), through the Policy Directorate and later the Environmental Health and Sanitation Directorate, has worked with sector stakeholders to review and revise the Environmental Sanitation Policy, first published in 1999. The Environmental Sanitation Policy, Revised 2010 (ESP, Revised 2010) was prepared through wide consultations at regional and national levels with stakeholders from districts, traditional authorities, NGOs, development partners, ministries, departments and agencies.

10. The preparation of the NESSAP was in phases and carried out within the context of Ghana's decentralised framework of administration and policy implementation. MMDAs completed an initial stage of gathering baseline data that informed the preparation of District-level Environmental Sanitation Strategies and Action Plans (DESSAPs), partially guided by the strategies and actions plans proposed in the initial version of the NESSAP (Preliminary NESSAP, September 2008).

11. The final NESSAP presents as much information as was reported by the MMDAs on the state of the environmental sanitation infrastructure and services. It also defines resources required and implementation packages covering all the components of environmental sanitation. An accompanying Strategic Environmental Sanitation Investment Plan (SESIP) provides further details of funding requirements and the framework for allocating estimated funding-gaps for projected improvements by 2015.

12. The NESSAP therefore provides the basis for MMDAs to commence incremental improvements for all aspects of environmental sanitation that can be measured and tracked towards Government of Ghana's vision of achieving middle-income status by 2020.

13. The NESSAP in addition serves as a useful reference as it presents background information from different sources and detailed analysis for incremental service improvement options for the various components of environmental sanitation.

Acknowledgements

14. The NESSAP is the result of the efforts of a wide range of stakeholders.

15. The framework for the NESSAP received inputs and comments from members of NESPOCC[3], staff of Ministries, Departments and Agencies (MDAs) as well as development partners. Following the participatory manner in which the revision of the Environmental Sanitation Policy (Revised, 2009) was carried out, the preparation of DESSAPs was made possible through Regional-level facilitation and consultations.

16. In this regard the following deserve special mention: Regional Coordinating Councils (RCCs), Regional Planning and Coordinating Units (RPCUs), the Regional Environmental Health and Sanitation Directorates (REHSDs), the regional offices of; Environmental Protection Agency (EPA), Hydrological Services Department (HSD), Town and Country Planning Department (TCPD), Ghana Health Service (GHS), Ghana Education Service (GES), Ghana Statistical Service, Community Water and Sanitation Agency (CWSA), Ghana Tourist Board (GTB) and the Ministry of Women and Children (MOWAC)/Department of Women (DOW).

17. The coordinating roles of the expanded District Planning Coordinating Units (DPCUs) and the support of Metropolitan, Municipal and District Chief Executives (MMDCEs) and Assembly members of the various MMDAs represent real ownership at the decentralized local government level and deserve commendation.

18. The Royal Netherlands Embassy (RNE) provided funding for the preparation of the NESSAP as part of the "Support to the Establishment of the Environmental Health and Sanitation Directorate (EHSD)" in the MLGRD. The preparatory phase of the programme was managed as part of the Policy Monitoring and Management Support (PMMS, 2004 - 2008) component of the second-phase of the Water and Sanitation Sector Programme Support (WSSPSII) funded by Danida.

19. The preparation of the NESSAP was carried out by a core specialist team of WasteCare Associates involving environmental, planning and institutional, legal, finance, IT and public health engineering experts, with specific inputs from other local and international experts.

20. The MLGRD and the Environmental Health and Sanitation Directorate (EHSD) wish to express their appreciation to all who have contributed in diverse ways to supporting these efforts.

[3] The National Environmental Sanitation Policy Coordination Council (NESPoCC) comprising MMDAs, key MDAs and the private sector is responsible for coordinating policy implementation.

Acronyms and Abbreviations

4BN	-	4th Battalion Infantry of the Ghana Army
ADRP	-	Accra District Rehabilitation Project
AESC	-	Architectural and Engineering Services Company
AIDS	-	Acquired Immune Deficiency Syndrome
AGD	-	Attorney General's Department
ATM	-	Automatic-Teller-Machine
ATMA	-	Accra-Tema Metropolitan Area
BoF	-	Bio-degradable Organic Fraction
CAGD	-	Controller and Accountant General's Department
CBO	-	Community Based Organization
CDM	-	Clean Development Mechanism
CEM	-	Country Economic Memorandum
CER	-	Certified Emission Reduction
CLTS	-	Community-Led Total Sanitation
CONINWAM	-	Coalition of NGOs in Waste Management
CONIWAS	-	Coalition of NGOs in Water and Sanitation
CPU	-	Central Processing Unit
CSIR	-	Centre for Scientific and Industrial Research
CWSA	-	Community Water and Sanitation Agency
DACF	-	District Assemblies Common Fund
DANIDA	-	Danish International Development Assistance
DBWS	-	District-Based Water and Sanitation
DESSAP	-	District Environmental Sanitation Strategy and Action Plan
DETRRR	-	Decentralized-Excreta-Treatment-Resource-Recovery and Re-use
DFR	-	Department of Feeder Roads
DHS	-	Demographic Health Survey
DP	-	Development Partners
DPCU	-	District Planning Coordinating Unit
DUR	-	Department of Urban Roads
DWSP	-	District Water and Sanitation Plan
EHA	-	Environmental Health Assistant
EHMD	-	Environmental Health and Management Department
EHSD	-	Environmental Health and Sanitation Directorate
ENSADA	-	Environmental Sanitation Day
EPA	-	Environmental Protection Agency
ESP	-	Environmental Sanitation Policy
ESAA	-	Environmental Sanitation Assessment and Audit
ESEEM	-	Environmental Sanitation Education and Enforcement Management
ESICOME	-	Expanded Sanitary Inspections, Compliance Management and Enforcement
ESP	-	Environmental Sanitation Policy
FBOs	-	Foreign Based Organization
FGD	-	Focus Group Discussion
FSTP	-	Faecal Sludge and Septage Treatment Plant
GDP	-	Gross Domestic Product
GHG	-	Greenhouse Gas
GHS	-	Ghana Health Service

GLSSV	-	Ghana Living Standards Survey, 5th Round
GNI	-	Gross National Income
GoG	-	Government of Ghana
GPRSII	-	Growth and Poverty Reduction Strategy
GSHS	-	Global School-based Student Health Survey
GTZ	-	Deutsche Gesellschaft für Technische Zusammenarbeit (German Society for Technical Cooperation)
GWCL	-	Ghana Water Company Limited
HCF	-	Health Care Facilities
HCW	-	Health Care Waste
HDA	-	High-Density Aerobic
HDR	-	Human Development Report
HIPC	-	Highly Indebted Poor Country
HIV	-	Human Immuno Virus
HSD	-	Hydrological Service Department
ID	-	Improved Dumping
IDA	-	International Development Association
IEC	-	Information, Education and Communication
IFAWAMI	-	Inter-Faith Waste Management Initiative
IGF	-	Internally Generated Fund
ILGS	-	Institute of Local Government Service
ISD	-	Information Services Department
ISIOs	-	Incremental Service Improvement Options
IWRM	-	Integrated Water Resources Management
IWSSD	-	International Water Supply and Sanitation Decade
IYS	-	International Year of Sanitation
K_fW	-	Kreditanstalt fur Wiederaufbau (German Development Co-operation Agency)
KMA	-	Kumasi Metropolitan Assembly
KNUST	-	Kwame Nkrumah University of Science and Technology
KPI	-	Key Person Interview
KVIP	-	Kumasi Ventilated Improved Pit
LEAP	-	Livelihood Empowerment Against Poverty
LFG	-	Landfill-gas
LGS	-	Local Government Service
LGSS	-	Local Government Service Secretariat
LVB	-	Land Valuation Board
M & E	-	Monitoring & Evaluation
MBT	-	Mechanical Biological Treatment
MDA	-	Ministries, Departments and Agencies
MDG	-	Millennium Development Goal
MEST	-	Ministry of Environment, Science and Technology
MFI	-	Micro-Finance Institutions
MICS	-	Multiple Indicator Cluster Survey
MINT*		Materials in Transition
MJ&AGD	-	Ministry of Justice and Attorney General's Department
MLFNR&M	-	Ministry of Land, Forestry, Natural Resource and Mines
MLGRD	-	Ministry of Local Government, Rural Development
MMDA	-	Metropolitan, Municipal and District Assembly
MMDCEs		Metropolitan, Municipal and District Chief Executives
MoC	-	Ministry of Communication
MoCC	-	Ministry of Chieftaincy and Culture

MoE	-	Ministry of Education
MOFA	-	Ministry of Food and Agriculture
MoFEP	-	Ministry of Finance and Economic Planning
MoH	-	Ministry of Health
MoI	-	Ministry of Information
MoJ	-	Ministry of Justice
MoTI	-	Ministry of Trade and Industry
MOWAC	-	Ministry of Women and Children Affairs
MRF	-	Materials Recovery Facility
MRT	-	Ministry of Roads and Transport
MTDPF	-	Medium Term Development Policy Framework
MTDPF	-	Medium Term Development Policy Framework (2010-13)
MWRWH	-	Ministry of Water Resources, Works and Housing
NCCE	-	National Commission for Civic Education
NCWSP	-	National Community Water and Sanitation Programme
NDPC	-	National Development Planning Commission
NESIMBoD	-	National Environmental Sanitation Investment Management Board
NESPoCC	-	National Environmental Sanitation Policy Co-ordination Council
NESSAP	-	National Environmental Sanitation Strategy and Action Plan
NGO	-	Non- Governmental Organization
NYEP	-	National Youth Employment Programme
OHCS	-	Office of Head of Civil Service
OPD	-	Out-Patient Department
PHAST	-	Participatory Hygiene and Sanitation Transformation
PLA	-	Participatory Learning and Action
PMMS	-	Policy Monitoring and Management Support
PoIP	-	Policy Implementation Plan
PPPPPs	-	Policies, Plans, Programmes, Projects and Products
PURC	-	Public Utilities Regulatory Commission
PWD	-	Public Works Department
R&D	-	Research and Development
RCB	-	Rural Community Bank
RCC	-	Regional Coordinating Council
REHSD	-	Regional Environmental Health and Sanitation Directorate
REHSU	-	Regional Environmental Health and Sanitation Unit
RNE	-	Royal Netherlands Embassy
RPCU	-	Regional Planning Coordinating Unit
RWST	-	Regional Water and Sanitation Team
SARAR		Self-esteem, Associative Strengths, Resourcefulness, Action-Planning and Responsibility
SEA	-	Strategic Environmental Assessment
SESIP	-	Strategic Environmental Sanitation Investment Plan
SH	-	Schools of Hygiene
SHEP/GES	-	School Health Education Programme of Ghana Education Service
SIF	-	Social Investment Fund
SL	-	Sanitary Landfill
SSHE	-	School Sanitation and Hygiene Education
STI	-	Sexually Transmitted Infection
SWA	-	Sanitation and Water for ALL
TCPD	-	Town and Country Planning Department
TTC	-	Teacher Training College
UCC	-	University of Cape Coast

UDS	-	University of Development Studies
UESP	-	Urban Environmental Sanitation Project
UEW	-	University of Education, Winneba
UG	-	University of Ghana
UKVO	-	United Kingdom Voluntary Office
UNDP	-	United Nations Development Porgramme
UNICEF	-	United Nations Children Fund
WATSAN	-	Water and Sanitation
WC	-	Water Closet
WD	-	Water Directorate
WEEE	-	Waste-Electrical and Electronic Equipment
WHO	-	World Health Organization
WHS	-	World Health Survey
WRC	-	Water Resources Commission
WSB	-	Water and Sanitation Board
WSSIPS	-	Water and Sanitation Sector Support Programmes
WTE	-	Waste to Energy
YES	-	Youth Engagement in Service

Executive Summary

21. Environmental sanitation consists of activities aimed at developing and maintaining of a clean, safe and pleasant physical and natural environment in all human settlements, to promote the socio-cultural, economic and physical well-being of all sections of the population. It comprises a number of complementary activities, including the provision and maintenance of sanitary facilities, the provision of services, public education, community and individual action, regulation and legislation supported by clearly mandated institutions, adequate funding and research and development (Environmental Sanitation Policy, Revised 2010).

22. This National Environmental Sanitation Strategy and Action Plan (NESSAP), *Materials in Transition* (MINT*) serves as a driver for changing the perception of Ghanaians on all types of wastes - both liquid and solid and thus affect sanitation-behaviour. The philosophy of MINT* is that waste is a material resource which is not to be discarded but value added on at various stages while in transition within the production and consumption cycles.

23. MINTing also has the potential of creating 'green collar' jobs and reducing MMDAs cost of managing wastes.

24. Improving the delivery of environmental sanitation services is one of the key challenges of our times. Currently, MMDAs spend about a third of municipal budgets on environmental sanitation besides periodic support from District Assemblies Common Fund (DACF), Highly Indebted and Poor Countries (HIPC) and other sources. However, this is inadequate and it is reflected in poor environmental conditions.

25. Environmental sanitation is considered as a major component of the current Medium-Term Development Policy Framework (MTDPF, 2010 – 2013) as well as the previous Growth and Poverty and Reduction Strategy (GPRSII, 2006 -2009). This is adequately captured under the Expanded Development of Production Infrastructure pillar of the MTDPF (2010 – 2013).

26. Creating awareness for change in environmental sanitation behaviour of all citizens and improving enforcement management are important strategies that can remedy the poor situation of services. In addition to this, improving the knowledge and expertise of sector staff is critical. The Environmental Sanitation Policy (Revised, 2009) supports the above goals and recommends institutional strengthening and capacity enhancement of sector institutions and staff as an important requirement.

27. The National Environmental Sanitation Strategy and Action Plan (NESSAP) is in response to the need to refocus environmental sanitation sector in Ghana to meet MTDPF (2010 – 2013) objectives as well as those of MDGs and other recent international initiatives such as the Sanitation and Water for ALL: a Global Framework for Action (SWA).

28. The NESSAP is a first-time attempt at providing strategic proposals and action plans with a country-wide scope. Hitherto interventions have been carried out by implementing specific projects only.

29. The ESP, Revised 2010 defines the implementation roles of key stakeholders. The NESSAP is to guide all sector actors - Ministries, Departments and Agencies (MDAs), Metropolitan, Municipal and District Assemblies (MMDAs), Private Sector,

Development Partners, NGOs, Traditional Authorities and the media – to achieve incremental improvements over the long-term planning horizon, 2008 – 2025.

30. The NESSAP is a first attempt at translating the measures of the objectives of the ESP, Revised 2010 into actionable targets and implementation packages. It was prepared in phases and carried out within the context of Ghana's decentralised framework of administration and policy implementation.

31. Adopting a "top-down, bottom-up" planning approach, an overview of the existing situation, focus areas of the revised policy and the strategies and actions to meet policy objectives were initially described. This provided the national-level "*top-down"* strategic proposals.

32. As an essential element of the process of completing the NESSAP and following National Development Planning Commission (NDPC) guidelines for preparing plans for implementation at district-level, MMDAs carried out a comprehensive baseline data collection. This first-time effort of collecting data country-wide informs the preparation of District-level Environmental Sanitation Strategies and Action Plans (DESSAPs).

33. Targets differ from district to district and this influences district-specific strategies and action plans. The DESSAPs provide the district-level "*bottom-up*" data and strategies for updating the NESSAP periodically.

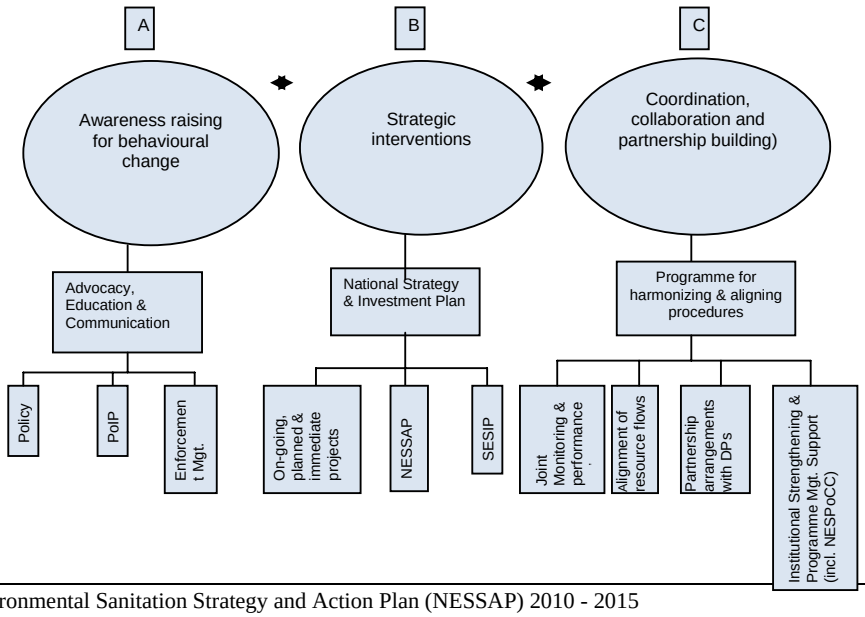
34. Besides the NESSAP a related Strategic Environmental Sanitation Investment Plan (SESIP) is also being prepared to provide the framework for financing the deficits and projected improvements in environmental sanitation infrastructure and services.

35. It is expected that with the NESSAP and SESIP in place, and DESSAPs finalised and harmonised with Medium-term Development Plans (MTDPs), MMDAs shall commence a process of incremental improvements in all aspects of environmental sanitation.

36. It is also expected that through vigorous expression of the need to undertake these environmental sanitation improvements, substantial funding will be made available for implementing the MTDPs of MMDAs.

37. The NESSAP presents the status of environmental sanitation and its development over the years. It identifies the focus areas of the ESP (Revised, 2009) and the strategies and actions proposed to meet policy objectives.

Figure ES1. Framework for National Environmental Sanitation Development in Ghana



38. The ***Introduction*** and ***background*** gives a brief overview of the development context in which environmental sanitation is seen as an important component in the overall human development agenda. It also presents the framework for preparing the NESSAP, including the fact that it is based on proposed measures and actions of the ESP, Revised 2010.

39. The framework for the NESSAP is presented in the above figure, and is made of; (A) awareness raising for behavioural change based on advocacy, political prioritisaton and improved enforcement management by well trained sector staff, (B) undertaking strategic interventions based on DESSAPs, NESSAP and SESIP that recognises on-going and planned projects, and (C) ensuring effective coordination, collaboration and partnership building amongst all key sector stakeholders.

40. In line with the definition of the components of environmental sanitation in the ESP, Revised 2010, the NESSAP strategies and action plans cover;
    (a) Solid Waste Management;
    (b) Excreta (Liquid Waste) Management
    (c) Storm-water Drainage and Sullage Conveyance;
    (d) Environmental Sanitation Education and Enforcement Management
    (e) Health-care and Special Industrial Wastes;

41. The policy focus areas are:
    i. Capacity Development
    ii. Information, Education and Communication
    iii. Legislation and Regulation
    iv. Levels of Service
    v. Sustainable Financing and Cost Recovery
    vi. Research and Development
    vii. Monitoring and Evaluation

42. The ***national profile*** provides a summary of geographical information about Ghana, socio-economic data and key environmental issues and how these relate to the state of environmental sanitation. The institutional context of environmental sanitation is also presented covering the main sector Ministries, Department and Agencies (MDAs) and how they relate to MMDAs. The legal and regulatory framework for the sector is also discussed including the role of the Local Government Service.

43. The ***current state of environmental sanitation*** presents an overview of situational analysis and is derived from many sources including review of project documents, 2000 Population and Housing Census, Multiple Indicator Cluster Survey (MICS, 2006), Annual Progress Reports (2007 and 2008) of GPRSII, Ghana Demographic and Health Survey (GDHS, 2008) and baseline data gathered by MMDAs. The detail of information differs from one component to the other. It is expected that as Metropolitan, Municipal and District Assemblies (MMDAs) update their DESSAPs annually, the quality of information will improve.

44. For *solid wastes*, the 2000 Housing and Population Census reports that on the national level, 4.8% of households have their waste collected directly from their dwelling, 7.9% burn their household refuse, 57.6% use various household receptacles for storage and send it to designated public dumps including communal-container stations or sanitary sites. It is reported that 25.9% of households dump their refuse at unspecified locations including vacant lots, drains, embankment of water courses, rivers, lakes and wetlands.

45. From data collected in 2008 by MMDAs for the preparation of DESSAPs more than 70% of residents resort to indiscriminate means of disposing of their refuse.

46. Available data for Ghana's five largest cities show that projected collection and transport ratios (waste collected and transported to disposal/waste generated) for refuse is gradually improving over the last few years. Estimates for 2010 are as follows: Accra 75%, Kumasi 85%, Sekondi-Takoradi 80%, Tamale 65% and Tema 70% (MMDA/MLGRD-UESP II).

47. The poor disposal of refuse both in communities and its management at final disposal sites remain a bottle-neck faced by all MMDAs. Crude, open dumping is the practice in almost all communities. In the few cases where controlled-dumping is practiced, environmental impact whether immediate or long-term are ignored. Implementing improved site management procedures is therefore, often only in reaction to public outcry and threat of closure of operations by nearby communities.

48. Kumasi and Tamale are the only two cities with engineered landfills. Accra, the capital city, has no engineered disposal site and refuse is disposed off in abandoned quarries in adjoining districts.

49. For *excreta management* i.e. the "hygienic disposal of human excreta" the options available include the use of on-site and off-site systems - pit latrines, VIPs, K-VIPs, WC/Septic Tanks, Aqua Privies, variations of ecological sanitation facilities and waterborne sewerage systems.

50. From surveys carried out by MMDAs in 2008/2009 about 45% of households use flush toilets (water closets connected to cesspits and septic tanks mostly without drain fields), 17% rely on pit latrines, 23% use VIPs, 1% use aqua-privies (or septic-tank latrines), 7% use KVIPs, 4 % resort to other means (including open-defaecation and wrap-and-throw). The use of unhygienic and health-threatening pan (or bucket) latrines still exist accounting for about 3% of household usage, especially in quarters of government ministries and police barracks in regional and district capitals. In addition, there are close to 5,200 pan (bucket) latrines in the Greater Accra Metropolitan Area (GAMA) alone out of about 20,000 country-wide. The use of public toilets is still prevalent with 30% of households relying on various public toilets - WCs, KVIPs and Aqua Privies.

51. The national average for sewerage coverage has persistently being as low as 4.5%. Tema and Akosombo are the only townships with a comprehensive sewerage system. Accra and Kumasi have limited sewerage. The treatment facilities for both the Accra and Tema systems as is typical of many sewage and septage/faecal sludge treatment facilities, are non-functional.

52. In terms of sanitation coverage (access to toilet facilities), available figures give average national coverage of about 55%[4], with wide variations in regional coverage between Upper Eastern Region (10%) and, say, Greater Accra Region (80%). However, it is important to note that growth of population in rural and peri-urban and low-income communities, will off-set greatly the progress and gains that are being achieved.

53. The section on the overview also discusses *environment* and *health impacts* focusing on *malaria*, *HIV/AIDS* and *Global Warming*. The section also discusses *gender*, *poverty* and *governance* issues and how they are influenced by improving environmental sanitation services, and importantly, the financial administration framework and how these affect MMDAs and funding allocations to the sector.

54. In the past ten years the *drainage* situation in Ghana's largest cities has improved somewhat with the provision of primary drainage infrastructure as part of the Urban

[4] This includes "shared facilities" at the household level. The WHO/UNICEF Joint Monitoring Program (JMP) does not regard shared facilities as improved facilities.

Environmental Sanitation Project (UESP) series[5] and improvement of roadside drains in a number of towns.

55. Overall, there is a dire deficit in drainage infrastructure in Ghana and urgent action is required if the contribution of improved drainage to communal well-being is to be realized. Flooding and flood-related loss and destruction of properties, traffic disruption and displacement of persons is a regular occurrence during rainy seasons and the approach of rainy seasons is now viewed with anxiety and insecurity by many a resident of all cities and large towns.

56. Implementing effective awareness raising strategies for improving environmental sanitation behaviour is an important part of the NESSAP. Therefore, the section on *environmental sanitation education* and *enforcement management* presents the many approaches employed in the sector.

57. The currently low level (about 40%) of the population with access to improved sanitation facilities at household level, and the continued presence of pan-latrines in houses (3% nationally), which was banned about a decade ago all illustrate ineffective application of enforcement and sanctioning systems which hitherto were the main vehicles for ensuring compliance.

58. The key players in environmental health/hygiene education in Ghana are the MoH, the MLGRD and the Ministry of Education, (MoE). Participatory methods like Participatory Learning and Action (PLA), SARAR and Participatory Hygiene and Sanitation Transformation (PHAST) and others are applied extensively to facilitate hygiene education especially within the water and sanitation sector.

59. *Community-Led Total Sanitation* (CLTS) is emerging as an effective means of mobilizing communities that have the potential of triggering individual and collective communal action to improve environmental sanitation and is proving to be effective for considering issues beyond mere "toiletisation". The broadening of the scope of sanitation beyond "hygienic disposal of excreta" to include wastewater (sullage) as proposed by the IYS framework provides opportunity to adapting CLTS for application in the Ghana context learning from experiences of other countries that have set the pace.

60. Ghana's Public-Private Partnership for Hand-washing with Soap initiative has achieved much acclaim and will be integrated in CLTS methods to be developed and adopted locally, and in School Sanitation and Hygiene Education (SSHE) programmes.

61. *The Expanded Sanitary Inspections, Compliance Management and Enforcement (ESICOME)* programme was initiated in 1999 to revisit the previously effective colonial and post-independence sanitary inspection and enforcement of bye-laws and therefore covers premises inspection; environmental hygiene education, dissemination of sanitary information, and enforcement of sanitary regulations.

62. *Health-Care Wastes* and *Special Industrial Hazardous Wastes* are discussed in the NESSAP together to bring to the fore the need for special handling of this category of wastes which is currently not given much attention by MMDAs who are responsible for waste management and agencies such as EPA which has the legal mandate to ensure adherence to standards and compliance to regulations.

63. The bulk of wastes generated from Health-Care Facilities (HCFs) are generally not hazardous but need more careful handling because of the risk of contamination. Currently, information on the sources of HealthCare Waste (HCW) and the level of management practice is inadequate. The hazardous component e.g. pathological waste,

[5] The UESP series Phase 1 (1996 – 2002) and Phase II (2004 – 2010) financed by GoG/World Bank.

pharmaceuticals and sharps which require special handling and management are currently, in the main, mixed with the municipal refuse and transported to refuse dumps.

64. Information on *Special industrial hazardous wastes* from industry and some specialised artisanal operations is inadequate. These categories of wastes are hazardous if they either pose substantial or potential threats to public health and/or the environment due to being flammable, oxidising, corrosive, toxic, alkaline, radioactive and/or explosive.

65. In this NESSAP new sources of waste of indeterminate long-term effect is classified as hazardous until declassified by the relevant authority such as the EPA; included in this category are various waste-electrical and electronic equipment (WEEE), electromagnetic cards used for telephony and other identification-transactions such as Automatic-Teller-Machines (ATMs), spent energy-saving CFC bulbs (contains mercury), CPUs, batteries, etc. Systematic gathering and analyses of the waste stream from many industries and such sources is not carried out by the relevant authority and, in the short term, hinders the development of any meaningful strategies besides instituting measures for collecting information on, and characterising them.

66. The NESSAP presents the current modes of financial administration at MMDAs as well as the various sources of revenue for development including environmental sanitation. The main sources of revenue for the MMDAs are allocations from the DACF, Internally Generated Funds (IGFs), donor support and other special funds such as HIPC, LEAP, Capitation Grant etc.

67. For the period 2004 – 2007 the total public expenditure grew from GH¢2.19 billion to GH¢4.25 billion. During this same period the average share of total MMDA expenditure was about 5.5%. The nominal allocation by MMDAs for environmental sanitation ranges from 15% to 30% of total revenue.

68. The core of the NESSAP is the section which deals with the main ***national-level objectives and strategies***.

69. The main challenge facing the sector is institutional strengthening and capacity enhancement. The strategies for **capacity development** in the *short-term* include institutional strengthening focused on the establishment of the Environmental Health and Sanitation Directorate (EHSD) to enable it effectively facilitate implementation of strategies by MMDAs.

70. The *medium-term* strategies are intended to improve the human resource base within the "green economy" sector. To ensure a steady supply of high grade "green collar" staff and stem the high rate of "cross-over" to other sectors.

71. In the *long-term*, it is envisaged that building on the above strategies will enable the appointment of key staff including public health engineers and planners at REHSDs, public health and drain maintenance engineers at metropolitan and municipal assemblies, and at the minimum an environmental health technologist per district by 2020.

72. For **Information, Education and Communication**, the *short-term* will involve the implementation of the Communication Plan for the ESP, Revised 2010 to ensure widespread dissemination. It is proposed that the day designated as Environmental Sanitation Day (ENSADA) be observed as part of the annual National Environmental Sanitation Conference within the National Environmental Sanitation Week.

73. In the short- to medium-term, the core strategies for IEC have to deal with how **Environmental Sanitation Education and Enforcement Management** is effectively achieved through the engagement and participation of individuals, households and

communities. Reinforcing SHEP activities and mainstreaming hand-washing initiative as part of School Sanitation and Hygiene Education (SSHE) as well as Community-Led Total Sanitation (CLTS) will be adapted and rolled out country-wide. Reintroduction of the ESICOME programme and linking it to the NYEP "sanitation guards" and Eco-brigade modules will be strategic components for enhancing enforcement management.

74. With regards to **Legislation and Regulation**, the *short-term* strategy will focus on strengthening the legal framework to improve environmental sanitation and will include assessing relevant bye-laws to identify gaps and improve them where necessary. Typical areas that need to be catered for include preparation of model bye-laws on environmental sanitation and made available to all MMDAs to ensure consistency in their application.

75. In the *medium term*, in support of enforcement of environmental regulations the existing process of building and development permitting by MMDAs will be updated to include the relevant sections of the Environmental Assessment Regulations, 1999 (LI1652). Dissemination of these updated processes will be carried out as part of environmental sanitation education.

76. To improve the general enforcement mechanism and prosecution of environmental sanitation offences, the Judicial Service will be supported to train members of the bench on relevant legislation.

77. In the *long-term* it is expected that *Sanitation Courts* will be established to deal with environmental cases.

78. **Sustainable financing and cost recovery** strategies in the *short-term*, will involve the facilitation and the provision of appropriate incentives that gives investor-confidence to induce injection of capital by the private sector in improving services including provision of public toilets, refuse collection and cesspit-emptying vehicles, and construction of treatment and disposal facilities.

79. As a rule the "polluter-pays-principle" will be applied in determining levies, fees and fines, adequate for meeting the costs of services incident on various components and sources of the waste stream.

80. To ensure systematic funding for DESSAPs within the MTDP framework, MMDAs shall set up and operate a dedicated fund for environmental sanitation. As a transitional measure to operating the dedicated fund, MMDAs shall be required to establish separate budget lines for the components of services and manage revenues for such services separately and exclusively.

81. Once the SESIP becomes operational and the national and MMDA funding sources are in place these will provide the needed financing over the medium- to long-term period for the NESSAP. Government will progressively increase its share of allocations of the DACF targeted to environmental sanitation. As part of medium-term strategies government will set up an institutional mechanism for the effective management of investments in the sector.

82. In order to ensure sustainable financing of services and gradually improve levels of services, direct cost-recovery shall be applied. Consideration will be given to affordability, differential tariffs, cross-subsidisation and MINTing. MMDAs will also establish participatory procedures for setting tariffs involving private sector operators and user-groups.

83. **Levels of Service** refers to the quality of the various environmental sanitation services such as toilet types, type of waste collection service and frequency, mode of treatment,

etc. These are classified as *minimum, comfortable,* and *amenity*[6]. Levels of Service vary for different communities and need to be appropriately targeted in the DESSAPs. In the *short-term*, Districts will incorporate their DESSAPs in the next MTDPs which will become operational from 2010. The first round of DESSAPs will target achieving "minimum" levels of service by the end of 2015.

84. In the *medium-term*, it is expected that the involvement of the private sector will bring innovation and improve levels of service beyond "minimum" levels. MMDAs shall regulate and assess the performance of private operators and be able to intervene and restore services promptly in the event of breakdown of services.

85. The *short term* strategy for **Research and Development** (R&D) would focus on value-chain analysis[7] (VCA) involving data gathering and assessments to determine the nature and types and volumes of wastes generated from various sectors of the economy nation-wide and to establish the demand for the various infrastructure and services. Special emphasis would be placed on the characterization of wastes from industrial and commercial sources, especially non-biodegradable-organic-fractions, special and hazardous wastes.

86. In the *medium to long term*, assessment of the capabilities of the various research and service institutions would be carried out with the aim of providing them appropriate support for research on environmental sanitation as well as development of capacity of local researchers.

87. During this phase, specific R & D for *solid waste management* would focus on supporting local private sector entrepreneurs and artisanal entities to produce machines, equipment and tools appropriate for local use. Furthermore, support would be given to research in handling and alternative uses of existing and changing composition of waste streams including value chain analysis of waste streams.

88. For **Monitoring and Evaluation**, the foundations for implementing an effective M & E system would be established in the *short term* as part of the pre-implementation stages of DESSAPs. This would involve building on assessed capacity needs at all levels for effective M & E. The NESSAP Results-Based M&E covers activities and targets of the focus areas. For each of them, sets of indicators for input/activities, output, outcome and impacts have been set as applicable.

89. The M&E strategy of NESSAP is built on the established collaborative mechanism used during the preparation of DESSAPs. This involves the RPCU, REHD staff and heads of all related sector institutions at the regional level. They will collate and validate all relevant information on the status of all ongoing NESSAP/DESSAP programs and projects in the regions and submitted on monthly and quarterly basis to the EHSD/MLGRD.

90. Up to the *medium term*, emphasis would be placed on strengthening structures for effective M&E including mechanisms for MMDA- and sub-metropolitan districts, zonal, town and area councils community-level monitoring.

91. It is expected that monitoring and evaluation of the performance of facilities and services would be a permanent feature during the implementation of the NESSAP.

[6] Qualitative description of "unacceptable, minimum, comfortable and amenity" levels of service is provided in Manual for the Preparation of District Waste Management Plans in Ghana. Best Practice Environmental Guidelines Series No.3, pp. 53. EPA/MES/MLGRD, July 2002.

[7] Value Chain Analysis (VCA) of SWM for example covers the functions of storage, collection, transport, treatment and disposal in order to identify opportunities for adding value at each stage. This is in line with the MINT philosophy.

92. A strategic focus of the NESSAP RB-M&E will measure how the various segments of the "green economy" are responding to policy actions and affecting the total economy. For example, the growth in "green-collar" jobs as a proportion of the total employment levels in the country will be assessed periodically.

93. At the national level, the National Environmental Sanitation Conference (NESCON) will provide the platform for the dissemination of sector performance.

94. The section on ***requirements for improvements in services and infrastructure***, discusses proposals for incremental options to be implemented over the periods 2010 – 2015, 2016 – 2020, 2021 – 2025. The first phase is formulated to achieve the *immediate*, *short-term* and some aspects of *medium-term* strategies of the NESSAP by 2015, the target year of the Millennium Development Goals (MDGs).

Box ES1: Details of Enabling Elements and Levels of Service

Enabling Elements	*Levels of Service*
- Capacity enhancement & management support - Environmental Sanitation Educations (Information, Education and Communication) - Enforcement Management (Legislation and regulation) - Sustainable financing and cost recovery - Research and development - Monitoring and Evaluation	***Incremental Service Improvement Options (ISIOs)*** for -solid waste management - material recovery and disposal facilities (e.g. landfills) - excreta (liquid waste) management - stormwater and sullage conveyance - health-care facility waste

95. A further strategic approach of the NESSAP is the grouping of the seven (7) focus areas under two main components, namely "*enabling elements*" and "*levels of service*". These two categories broadly correspond to "software" and "hardware" measures and/or activities of the plan. This is shown in Box ES1.

96. The proposed requirements for improvements are also based on the three qualitative service-levels defined by the MLGRD/MEST. These qualitative levels of service are ***"minimum, comfortable, and amenity***".

97. The above levels of service are detailed further to correspond to specific modes referred to as *Incremental Service Improvement Options* (ISIOs). The ISIOs present a basis for gradual improvements across all components of environmental sanitation.

98. Resources to meet required improvements of the focus areas, determined using unit costs and/or expenditure functions. The total funding requirements for phase one is GH¢1,022,186,415. The details are presented in the Table ES1.

Table ES1: Summary Cost of implementing Improvements (Focus Areas)

Focus Area		TOTAL COSTS (GH¢)
Enabling Elements	Capacity Development	138,406,620
	Information, Education & Communication	1,275,500
	Legislation & Regulation	8,337,000
	Financing and Cost Recovery	403,955
	Research & Development	636,170
	Monitoring & Evaluation	9,072,850
	Levels of Service + Prg. Support	1,159,528,992
	GRAND TOTAL	**1,317,661,087**

99. The final section presents the ***implementation packages***, institutional arrangements for delivering the requirements of the NESSAP focus areas and the Results-Based Monitoring and Evaluation framework. The cost of the four (4) implementation packages over the first phase is shown in Table ES2.

Table ES2: NESSAP Implementation Programmes

Item	Implementation Package (Programme)	Estimnated Cost (GH¢)
1	Institutional Development & Capacity Enhancement	15,141,120
2	Community Participation and Public Awareness Programme	133,660,075
3	Local Services Improvement Programme	1,098,239,376
4	Research, Performance Monitoring and Governance Programme	70,620,516
	TOTAL	1,317,661,087

100. The document concludes with institutional arrangements proposed for the implementation and management of the NESSAP as well as the Results-Based Monitoring and Evaluation (M&E) for the various activities and targets. For each of them, sets of indicators for inputs, outputs, outcome and impacts have been provided as applicable. A separate volume of annexes is provided to accompany the NESSAP document.

1 Introduction

1. Introduction

101. Effective delivery of environmental sanitation services remains one of the major intractable challenges facing Metropolitan, Municipal and District Assemblies (MMDAs). The impact of poor environmental sanitation is immediate – unsightly littering, foul-smelling excreta-laden and choked gutters, stagnant pools of water and flooding during rains, vermin and rodents on mounds of refuse dumps, and the attendant prevalence of malaria, cholera, diarrhoea and typhoid in all communities.

102. The fact is that environmental sanitation services continue to take more than 35% of municipal budgets besides periodic support from the District Assemblies'' Common Fund[8] (DACF), the Highly Indebted Poor Countries (HIPC) sources, and other specific-project interventions by Development Partners. The picture emerging is that *the burden of managing environmental sanitation services (even at current poor levels) is hindering improvement and development of other services in communities, towns and cities.*

103. Ghana is aspiring to reach middle-income status by 2020, with expected threefold increase in GDP from current levels. Figures released from the Ghana Statistical Service (GSS) disclosed that the revised real GDP estimate for 2009 is GH¢ 827.72 million, with the 2008 valued at GH¢ 794.82 million. The enlarged Ghanaian economy and improved incomes will lead to increases in all types of waste streams and further deterioration of services if effective strategies and plans are not put in place.

104. Environmental sanitation is considered as a major component of the Human Resource pillar of the GPRSII (2006 - 2009) as well as the current Medium-Term Development Policy Framework (MTDPF, 2010 – 2013). The Expanded Development of Production Infrastructure pillar of the MTDPF prioritizes environmental sanitation services as a key requirement for improving quality of life.

105. The Environmental Sanitation Policy (Revised, 2009) categorizes environmental sanitation as part of *essential services*.

106. The Ministry of Local Government and Rural Development (MLGRD) introduced a number of measures for improving and sustaining services by Metropolitan, Municipal and District Assemblies (MMDAs). Among others, MMDAs were to improve revenue mobilization, increase the proportion of house-to-house (door-to-door) services for improving paid-for refuse collection and aggressively promote household latrines.

107. These measures would contribute to improving environmental sanitation services, however, considering the progress achieved by other sectors that have national programmes such as water and health, a very important element that was still missing is a nationally-owned strategy that provides coherent and effective strategies for implementing policy measures as well as harnessing the required resources.

108. The MLGRD/Environmental Health and Sanitation Directorate (EHSD) therefore led the development of a comprehensive National Environmental Sanitation Strategy and Action Plan (NESSAP) and a Strategic Environmental Sanitation Investment Plan (SESIP). These are expected to facilitate gradual reversal of the deficits in services through effective implementation by MMDAs and other stakeholders.

[8] DACF is financed through not less than 5% (7.5% since January 2008) of the revenue resources of Ghana.

1.1 Framework for the NESSAP

109. The NESSAP was developed in phases through a highly participatory process. The framework for the NESSAP evolved from reviews of relevant national and international level processes as well as consultations with a wide range of stakeholders at district, regional and national levels.

110. An important outcome of the NESSAP formulation process is the adoption of *Materials in Transition* (MINT*) as a central philosophy which underlies the strategies and actions. MINT* is about engendering and changing perceptions on all types of wastes - both liquid and solid. The philosophy of MINT* is that waste is a material resource which is not discarded but value is added on at various stages in transition within the production and consumption cycle.

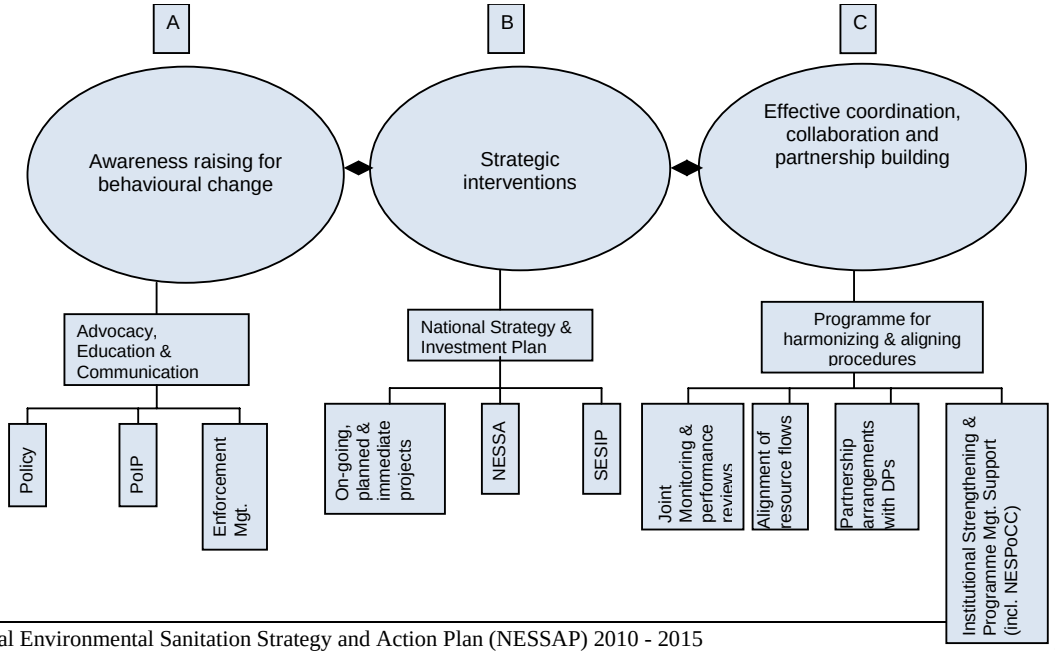
111. There is evidence that aesthetics – the appearance of a locality and the absence or presence of nuisance – influences behaviour that can add more to pollution and its impacts on health and costs. So also does the knowledge of the value-chains within wastes streams impact on our attitudes and how we regard discarded materials.

112. For example, biogas from excreta can serve as fuel and organic fractions which form the bulk of household solid waste can be converted to compost. Ultimately, even waste placed in a landfill is deemed to be in transition until it is mined at a future date for appropriate re-use, recycling or recovery.

113. MINTing also has the potential of creating 'green collar' jobs and reducing MMDAs cost of managing wastes. Value-chain analysis of the various waste streams reveals that there are numerous job opportunities within all the wastes management functions. These include value-pickers, buy-back centre operators, converters, urine collectors.

114. Figure 1.1 shows the main elements for improving environmental sanitation. *Firstly*, raising awareness for change in sanitation-behaviour and attitudes towards all wastes encompassing advocacy at the highest political levels, effectively implementing policies, and enhancing environmental sanitation education and enforcement management. *Secondly*, pursuing a phased programme for incremental improvements in all aspects of environmental sanitation services targeting the reduction of wastes for final disposal. *Thirdly*, ensuring effective coordination of, and collaboration among, sector stakeholders for country-wide adoption of policies, plans and programmes.

Figure 1.1 Framework for Environmental Sanitation Development in Ghana



115. The preparation of the NESSAP commenced in September 2007 with Key Person Interviews (KPIs) and Focus Group Discussions (FGDs) amongst key sector stakeholders and deliberations at the level of the National Environmental Sanitation Policy Coordination Council (NESPoCC) to formalize the approach.

116. In accordance with Ghana's decentralized system of governance and implementation management, national policies take effect at district level. Therefore, strategies, plans, programmes and projects to meet policy objectives are based on and derived from the aspirations of district level actors. To meet this basic principle a Handbook for preparing District Environmental Sanitation Strategy and Action Plan (DESSAP) was produced.

117. The DESSAPs prepared by MMDAs, with facilitation and coordination by regional-level institutions, provide the scale of the needed improvements in infrastructure and services of all districts of Ghana. The NESSAP is therefore a dynamic document and will be updated as more data and information is gathered and the levels of services improve in line with the objectives and measures of the ESP, Revised 2010.

118. The National Environmental Sanitation Strategy and Action Plan (NESSAP) - *Materials in Transition* (MINT*), translates the measures derived from the objectives of the ESP, Revised 2010 into strategies and planned activities. The NESSAP thus provides the basis for the systematic implementation of interventions for improving environmental sanitation infrastructure and services in Ghana following laid down planning processes.

1.2 The Environmental Sanitation Policy (Revised, 2009)

119. The Environmental Sanitation Policy (Revised, 2009) responds to the various reviews carried out to assess how effectively the previous policy published in 1999 has been implemented. The revised policy objectives and measures are presented in a way that enhances strategic planning and subsequent implementation.

120. The broad principles underlying Ghana's Environmental Sanitation Policy (Revised, 2009) are:

- The principle of environmental sanitation services as a public good;
- The principle of environmental sanitation services as an economic good;
- The polluter-pays-principle;
- The principle of cost recovery to ensure value-for-money ensuring economy, effectiveness and efficiency;
- The principle of subsidiarity in order to ensure participatory decision-making at the lowest appropriate level in society;
- The principle of improving equity and gender sensitivity;
- The principle of recognizing indigenous knowledge, diversity of religious and cultural practices;
- The precautionary principle that seeks to minimize activities that have the potential to negatively affect the integrity of all environmental resources;
- The principle of community participation and social intermediation

121. The ESP defines the principal components of environmental sanitation to include;

(a) Collection and sanitary disposal of wastes, including solid wastes, liquid wastes, excreta, industrial wastes, health-care and other hazardous wastes;

(b) Storm-water drainage;

(c) Cleansing of thoroughfares, markets and other public spaces;

(d) Control of pests and vectors of disease;
(e) Food hygiene;
(f) Environmental sanitation education;
(g) Inspection and enforcement of sanitary regulations;
(h) Disposal of the dead;
(i) Control of rearing and straying of animals;
(j) Monitoring the observance of environmental standards

1.2.1 Policy Focus Areas

122. In order to provide a clear basis for achieving the overall goal of the sector, the policy provides strategic elements under seven (7) policy focus areas, as follows:
    - Capacity Development
    - Information, Education and Communication
    - Legislation and Regulation
    - Levels of Service
    - Sustainable Financing and Cost Recovery
    - Research and Development
    - Monitoring and Evaluation

123. The various strategies and action plans of the NESSAP are derived from the objectives and measures under the above focal areas. These are presented in detail in Chapter 4 of this document.

1.3 Structure of the National Environmental Sanitation Strategy and Action Plan (NESSAP)

124. The contents of the NESSAP are arranged in a manner that gives readers a gradual introduction of the key challenges and issues of the environmental sanitation sector, followed by the strategies and plans required for addressing policy objectives and actions.

125. *Chapter 1* gives a brief overview of the existing situation and efforts made, so far, and the need for the NESSAP. The background also gives the processes followed in developing the NESSAP and how it is derived from, and based on the ESP, Revised 2010. The main principles and focus areas of the policy are presented.

126. *Chapter 2* provides a summary of geographical information about Ghana, socio-economic data and key environmental issues and how these relate to environmental sanitation. The main sector Ministries, Department and Agencies (MDAs) are provided, as well as how they relate to MMDAs, especially the issue of decentralized departments and how they fit in the operationalised Local Government Service.

127. *Chapter 3* presents the state of environmental sanitation services in Ghana. It treats all the key components of environmental sanitation defined in the ESP, Revised 2010: *solid waste, excreta (faecal liquid waste), stormwater drainage and sullage conveyance, environmental sanitation education and enforcement management, health-care and special industrial wastes*.

128. The information provided is based mainly on data from the 2000 Population and Housing Census and updates from other documents such as the Multiple Indicator Cluster Survey (MICS, 2006), Annual Performance Reviews (APRs) of the GPRSII, Ghana Demographic and Health Survey (2008) and baseline data gathered by districts, in 2008/2009, as part of the preparation of DESSAPs.

129. The third chapter concludes with discussions of environment and health impacts, gender, poverty and governance issues and how they are influenced by improving environmental sanitation services, and importantly, the financial administration framework and how these affect MMDAs and funding allocations to the sector.
130. *Chapter 4* deals with the main national-level strategies including those on institutional restructuring that affect capacity development, identified as the main challenge facing the sector.
131. The core strategies and action plans proposed for meeting the objectives under the main focus areas of the ESP (Revised 2010) are provided in this chapter. This section in essence outlines the Policy Implementation Plan (PoIP) based on national perspectives.
132. The fourth chapter ends with a discussion on the link between the NESSAP and DESSAPs prepared by MMDAs. It is expected that as MMDAs implement their DESSAPs, changing conditions on the ground will inform national strategies and targets which will be amended during periodic planning cycles.
133. *Chapter 5* of the NESSAP presents the requirements for improving environmental sanitation based on the measures and strategies of the previous chapter.
134. In order not to lose the important aspects of institutional capacity building and other factors that enhance delivery of services, a further categorisation of the focus areas and components into "*enabling elements*" and "*levels of service*" is presented in this chapter – these correspond to "software" and "hardware" measures respectively.
135. The fifth chapter also covers the options for the above categories and introduces the model for translating policy objectives to measures and then to implementation packages. The concept of Incremental Service Improvement Options (ISIOs) is also introduced. The chapter ends with initial costing of the various activities emanating from the measures, the corresponding strategies and ISIOs.
136. *Chapter 6* presents the implementation programmes of the NESSAP. It covers packages for "enabling elements" and "levels of service" and corresponding time-lines.
137. The sixth and concluding chapter also discusses institutional arrangements for implementing the NESSAP based on relevant regulations (e.g. Local Government Act, 1993 (Act 462). The chapter concludes with the presentation of Result-based Monitoring and Evaluation (R-B M&E) indicators of the key activities under the focus areas of the NESSAP.
138. The Annexes to the NESSAP provide further information including the key consultations held and additional background information.

2 National Profile

2. National Profile

139. Ghana is located between longitudes 3° 15' W and 1° 12' E, and above the equator on latitudes 4° 44' N and 11° 15' N in West Africa. It shares boundary with Togo to the East, Côte D'Ivoire to the West and Burkina Faso to the North and the Gulf of Guinea delimits the southern extent of the country (Figure 2.1). The coastline covers a distance of 550km, from Aflao (South-East) to Elubo (South-West). The total area of the country is about 238,539 km^2.

140. The country's life expectancy is 56 years with majority of the population concentrated in the southern part of the country. The country has a high poverty rate with 47% of the population estimated to be living under a US$1/day income. The GNI is estimated to be US$290 and per capita growth rate of 1.9%. Current total fertility rate (the average number of children by women aged 15-45 years) is about 4.5 children per woman whereas infant mortality rate is estimated to be 75 per 1,000 births (see Table 2.1).

Figure 2.1: Location of Ghana

Source: Survey Department, 2006

2.1 Socio-economic characteristics

2.1.1 Distribution of the urban/rural population

141. Ghana has experienced substantial increase in the level of urbanization since 1984: 43.8% in 2000 compared to 32.0% in 1984. However, the population of Ghana continues to be predominantly rural. Indeed, apart from Greater Accra (87.7%) and Ashanti (51.3%) regions, the rest of the country remains predominantly rural with none of the 8 remaining regions having a level of urbanization that is above the national average. The urban-to-rural population ratio of Ghana was projected to reach 50 percent by 2008.

Table 2.1: Country Specific Data

Total area	238,540 km^2
Populatio	23.351million (2008)
Rural population	50%
Urban population	50%
Life expectancy	56 years
GNI per capita (PPP)	.US$1,500
GNI per capita (Atlas)	US$670
GNI per capita growth rate	1.88%
Human Dev. Index	0.567 (129th)
Population growth rate	2.75%
Rural growth rate	2%
Urban growth rate	3%
Infant Mortality rate (per 1000 births)	75

Source: World Development Indicators, World Bank, 2008.

142. With a series of economic reforms that have deregulated the economy and stimulated domestic and foreign investment, the Ghanaian economy has grown at an average of

4.5% to 6% each year for the period 2003 - 2007. The agricultural sector remained unchanged as the largest contributor to the GDP despite a drop in growth rate in 2005. It is followed by the industrial sector and service sector respectively (see Table 2.2)

Table 2.2: Growth Rates (%):2002-2008

Sector	2002	2003	2004	2005	2006	2007	2008
Overall GDP growth	4.55	5.25	5.58	5.87	6.43	5.70	7.27
Agriculture	4.36	6.07	6.97	4.14	4.53	2.46	5.14
Industry	4.73	5.06	4.82	7.66	9.50	5.06	8.09
Services	4.71	4.69	4.92	6.95	6.73	10.05	9.25

Source: Ghana Statistical Service, 2009

2.2 Environmental Overview

143. Ghana has a warm tropical climate with mean annual temperatures ranging between 24°C and 36°C. Mean annual rainfall is around 2250mm in the southwest, 1000mm in the north and 900mm in the southeast. Humidity is high around the coastal areas and decreases going inland. The dry harmattan conditions occur from November to January throughout the country.

144. The major soil types are the oxysols, ochrosols, black earths, grey earths and the coastal regnosols. Other intergrades are acid gleisols found in alluvial soils, the lithosols found on steep slopes, the regnosols found on coastal sands and the sodium vleisols found in marshy and lagoon areas. The main determinants of these soil types are climate and vegetation of the area.

145. There are five major ecological zones - the Rain Forest, Semi-Deciduous Forest, Sudan Savanna, Guinea Savanna and the Coastal Savanna. A transitional zone consisting of a mixture of semi deciduous and savanna vegetation tends to occur in between the forest and the savanna. Mangrove forests also occur near lagoon and swampy areas on the coast. The vegetation types are influenced and modified by the effects of bushfires, agricultural activities, mining and unsustainable harvesting of natural resources.

146. The main river system is the Volta which is 1,600 km long with an artificial lake covering 9,500 m^2. The other rivers include, the Pra, Tano, Offin, Ankobra, Birim and Todzi. The total amount of water drained by these rivers is 54.4 billion m^3 of which 39.4 billion m^3 originates from within the country and 17.3 billion m^3 originate from outside the country.

147. There are numerous rivers, lakes and lagoons, though unevenly distributed. The largest lake is Bosumtwi, a large crater lake of about eighty meters (80 m) deep. There are many lagoons along the coast which serve important ecological and hydrological functions. The main ones are the Keta and Avu lagoon complex, Songhor lagoon in Ada, Chemu and Sakumo lagoons in Tema, Korle and Kpeshie lagoons in Accra, Fosu lagoon in Cape Coast, Benya, Nakwa and Jange lagoons, and Tano-Ehy lagoon complex.

148. Groundwater aquifers underlie almost the entire geographical area of Ghana. The occurrence and distribution of ground water is dependent on the geology and other such factors as topography and climate. Groundwater resources are found in two main rock formations; Sedimentary and Precambrian. Quality of groundwater is generally good except for some cases of localized pollution with high levels of iron and fluoride as well as high mineralization in some coastal aquifers.

149. Borehole yields vary widely, ranging between 180m^3/hr and 184m^3/hr (National Water Policy, 2007).

2.2.1 Major Environmental Concerns

150. Ghana is confronted with a number of serious environmental challenges. These include land degradation, coastal erosion, pollution of rivers and lagoons, deforestation, desertification and waste management. Table 2.3 below enumerates the top ten environmental challenges and notes their causes and effects.

Table 2.3: Key Environmental Problems in Ghana

Nature of concern	Causes	Effects	Indicators
1. Land degradation	Traditional farming methods Bush fires Clearing of watersheds Sand and stone winning Harvesting of firewood	Loss of top soil Loss of biodiversity Loss of medicinal plants Siltation of rivers Salination of soil	Area affected by erosio Area affected by salinisation Area of land contamina Area of water logging
2. Coastal erosion	Rising sea level Sand wining on beaches Harbour construction	Erosion of coast Loss of spawning ground	% land loss to erosion No of sand wining sites beach
3. Pollution of water bodies	Mining activities Indiscriminate waste disposal Farming along river banks Indiscriminate defecation	Damage to aquatic life Poor water quality Toxic water sources	Increase BOD in rivers % loss in aquatic life % faecal coliform in riv Use of agricultural pesticide
4. Deforestation	Timber exploitation Fuel wood extraction Shifting cultivation Bushfires	Loss of biodiversity Drying of streams Soil erosion	% loss of fauna, flora % loss of forest land/ye Number of bushfire/yea Annual Allowable Cut
5. Poor Waste management	Human activities Mining activities Industrial activities Agricultural activities	Increased soil toxicity Poor water quality Visual intrusion Increase in diseases Emerging diseases	Volume of types of wast No of waste treatment plants
6. Risk from chemical use	Use of chemicals in fishing Use of chemicals in hunting Agrochemical/pesticides use Industrial use of chemicals Spillage from mining activities	Polluted water bodies Polluted air Increase crop toxicity Death related to pesticides	Increase pesticides use Level of pesticide in cro Increase in pesticide rel disease. Chemical poisoning
7. Indoor air pollution	Use of charcoal and fuelwood Use of insecticides Use of mosquito coils Smoking cigarettes	Poor air quality Increase chest problems Increase in coughs	Emission of CO_2 Respiratory infections Expenditure on air pollution
8. Outdoor air pollution	Vehicular pollution Industrial pollution Dust from road construction Release of methane Stench from waste	Health problems increase Poor air quality Loss of flora and fauna	Emission of CO_2 Emission of Nitrogen ox Emission of Sulphur oxi Air quality Emission of GHG
9. Desertification	Climatic change Deforestation Poor farming practices Drying of local streams	Loss of livelihood Erosion Loss of vegetation cover	Increase in vegetation l Decrease in food production loss of soil moisture % loss of surface water
10. Large scale developments	Mining activities Factories near rivers Building on waterways	Loss of arable land Waste generation Flooding in Cities	Pollution levels of air, w Loss of aquatic life Houses flooded annuall

Source: Ghana State of the Environment - 2005 (Adapted from the SEA of GPRS, 2003 and Sustainable Development Indicators for Ghana)

2.3 Governance System (Institutional Arrangements)

151. The Republic of Ghana is a unitary state divided into ten administrative units or regions, each headed by a regional minister appointed by the President. The principal units of the regions are the District Assemblies (DAs), which constitute the Local Government.

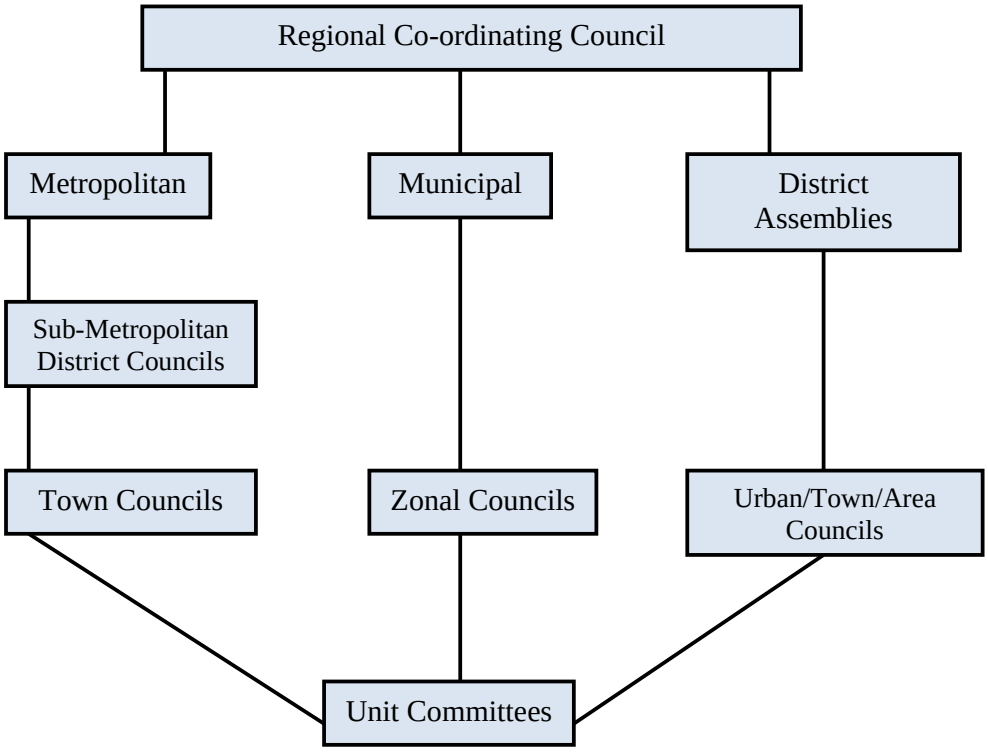
152. Currently there are 170 MMDAs. These include 6 Metropolitan and 24 Municipal Assemblies. Between the district assemblies and the central government are the Regional Coordinating Councils (RCCs). The RCCs are made up of the representatives from each of the District Assemblies in the Region and from the Regional House of Chiefs. The role of these bodies is to coordinate policy implementation by the DAs.

153. The DAs have deliberative, legislative and executive functions and are the planning authority for the districts. They exercise political and administrative authority in the district as well as to provide guidance, give direction and supervise all other administrative authorities in the district. DAs consist of elected and appointed representatives from within the defined geographical area of the district. The DAs are headed by the District Chief Executive (similar to a Mayor), who is appointed by the government and approved by the members of the Assembly.

154. The MMDAs are categorised by a number of socio-economic and demographic features: Metropolitan Assemblies (are based on areas with at least population of 250,000); Municipal Assemblies based on urban areas with at least population of 95,000); and District Assemblies (with at least population of 75,000).

155. The structure of the local government system and its sub-structures is shown in Fig 2.2.

Figure 2.2: Structure of the New Local Government System



2.3.1 Sector Co-ordination

156. In terms of sectoral arrangement, there are currently 25 sectors, each headed by a Minister appointed by the President and approved by Parliament. The sectors are broadly grouped into four major categories as specified below, namely: Social Service, Infrastructure development, Finance and Economy and Governance.

Table 2.4: Major Categories of Sectors

Governance	Finance and Economy
Ministry of Defence Ministry of Local Government and Rural Development Ministry of Foreign Affairs Ministry of Interior Ministry of Information Ministry of Justice and Attorney General's Dept. Ministry of Science, Environment and Technology	Ministry of Food and Agriculture Ministry of Finance and Economic Planning Ministry of Trade and Industry Ministry of Tourism
Infrastructure	**Social Services**
Ministry of Water Resources, Works and Housing Ministry of Transportation Ministry of Communication Ministry of Energy Ministry of Lands, Natural Resources, Forestry and Mines	Ministry of Education Ministry of Health Ministry of Women and Children Affairs Ministry of Employment and Social Welfare Ministry of Youth and Sports Ministry of Culture and Chieftaincy

Source: www.ghana.gov.gh

157. The Ministry of Local Government and Rural Development (MLGRD) is designated as a governance (administrative) agency. Other institutions of importance are the Council of State which acts in advisory capacity to the Executive President, and the National Development Planning Commission (NDPC). The NDPC coordinates all planning activities of the MMDAs and sector ministries in the country.

158. The 1992 Constitution does not make explicit provision for ministries, rather the power to create new ministries either from mergers or split of existing ones or entirely new ones lie with the President of the Republic of Ghana through the Directive Principles of State (Article 34 of 1992 Constitution). Thus ministries are provided for through specific Executive Instruments furnished by the Government of Ghana (GoG).

159. The Ministry of Local Government and Rural Development (MLGRD) is currently mandated to provide oversight and direction for: (a) developing policies and legislation with respect to local government (b) supervising and monitoring local administration; (c) monitoring and implementation of provisions of the Constitution specific to local governance issues such as decentralisation (including assisting District Assemblies in drafting bye-laws and guidelines, and initial proponents of Legislative Instruments (LIs) and acts in respective of local governments, such as those that deal with creation of new District Assemblies); (d) auditing local governments financial accounts; (e) providing guidelines to local governments with respect to procurement, tax rates, revenue mobilisation, infrastructure and municipal services including environmental sanitation, and (f) facilitating and coordinating through its departments, such as the Environmental Health and Sanitation Directorate (and other units), the plans and programmes of development partners which are ultimately implemented by District Assemblies.

2.3.2 Key Sector Institutions and Agencies

160. The Environmental Health and Sanitation Directorate (EHSD), under the Ministry of Local Government and Rural Development (MLGRD) was elevated from the position of a unit to a directorate in 2006 to provide a "more visible home for environmental sanitation" and also give the directorate "space" at high-level management meetings of the ministry.

161. The EHSD provides sector coordination and facilitation of MMDAs in implementing national-level and other ministries' programmes on environmental sanitation such as the Waste Management and Sanitation Module of the National Youth Employment Programme (NYEP) managed by the Ministry of Employment and Social Welfare.

162. At the Regional level, 10 REHSDs provide facilitation support to Environmental Health and Management Departments (EHMDs, provided for by policy at district level.

163. The Environmental Protection Agency (EPA) Act, 1994 (Act 490) established the EPA which is mandated to provide environmental standards and compliance management. EPA as a regulating agency has 10 Regional Offices. Two District offices have been established to respond to the specific needs for regulating the potential impacts of intense mining around Tarkwa area and industrial activities in the Port-City of Tema.

164. The Ministry of Health (MoH) and the Ghana Health Service are responsible for the management of health services in the country and providing health data, supporting health education activities, and contributing to regulation and standard-setting for health services. The health sector relies on environmental sanitation data and information to contribute to disease prevention and control.

165. The Ministry of Education and tertiary education institutions are responsible for hygiene education. The School Health Education Programme (SHEP) supports nation-wide education and provides Training and Learning Materials.

166. The Ministry of Water Resources, Works and Housing (MWRWH) is the principal water sector ministry responsible for overall water policy formulation, planning, coordination, collaboration, monitoring and evaluation of programmes for water supply.

167. The Water Directorate is the focal point for coordination of the water sector, while a newly created Housing Directorate is the focal point for housing.

168. The Ministry of Women and Children (MOWAC) is the lead agency responsible for implementing the National Gender and Children's policy. Policy issues on environmental sanitation that affect the wellbeing of women and children is within the mandate of MOWAC.

169. The Town and Country Planning Department (TCPD) is responsible for all land-use planning in the country. It supports MMDAs in physical planning of towns and provides layouts of towns for the development of services like roads, drainage and sewerage networks, disposal sites and water supply distribution lines.

170. The Ghana Statistical Services (GSS) is the statutory institution responsible for demographic data and official government statistics. GSS provides coverage data on environmental sanitation services.

171. The Hydrological Services Department (HSD) is responsible for managing information on hydrology as well as planning and design of primary drains throughout the country.

172. The Community Water and Sanitation Agency (CWSA) of the MWRWH is the lead facilitator of the water supply in rural communities and small towns, and plays important roles in sanitation and hygiene promotion in rural areas. The key functions of

CWSA are set out in the Community Water and Sanitation Agency (CWSA) Act, 1998 (Act 564).

173. The Ghana Water Company Limited (GWCL) is the assets owner and responsible for the provision of water services in 82 urban water systems across the country.

174. The Department of Urban Roads (DUR) is responsible for the construction and maintenance of roads and related infrastructure. The maintenance management of road-side drains is an important aspect of environmental sanitation that is facilitated by the unit.

175. The Department of Feeder Roads (DFR) of the Ministry of Transport is responsible for feeder roads in rural areas and the related infrastructure such as road-side earth and stone-pitch drains for protecting road embankments.

2.3.2 Legal and Regulatory Framework for Local Governance

176. The country is governed by a constitution approved by a referendum in 1992, the fourth in the attempt at constitutional rule in the country. It provides for a three tier system of governance: The Executive, the Legislature and the Judiciary acting independently and inter-dependently of each other.

177. The Constitution provides for an Executive President who has a maximum of two four-year terms, an elected Legislature (Parliament) representing the total number of constituencies in Ghana.

178. Chapter Six of the Constitution "*The Directive Principles of State Policy*" provides the broad framework and guidance for all decisions regarding application of the constitution itself and actions of all citizens, Parliament, the President, the Judiciary, the Council of State, the Cabinet, political parties and other bodies.

179. The provision of environmental sanitation infrastructure and services affect a number of line ministries, departments and agencies. While the Local Government Act, 1993 (Act 462) and Local Government Service Act, 2003 (Act 656) seek to effectively transfer the functions and offices of central ministries, departments and agencies to the Assemblies, this has not happened and many still exist and function as central government dependencies.

180. The important issues of career development and progression not very clearly defined for technical staff in local government make many of such staff still identify themselves with central agencies. Furthermore, many agencies continue to provide facilitation and implementation support to MMDAs. The position and functions of the 10 Regional Coordinating Councils (RCCs) compound issues the more.

181. MMDAs still depend on national- and regional-level departments and agencies for facilitation and implementation support. However, the working boundaries and zones of these institutions are in many cases not aligned to those of MMDAs. This adds to the challenges of effective coordination at the district level. Figure 2.3 gives a picture of how multi-agency facilitation is required and carried out for the delivery of certain aspects of environmental sanitation services. Figures 2.4 to 2.7 show the organograms of Waste Management Departments and Environmental Health and Management Departments of MMDAs

182. For purposes of planning, the decentralized planning system as outlined in the National Development Planning Systems Act 1994 (Act 480), comprises the District Planning Authority at the district-level, Regional Coordinating Council at the regional level, sector Ministries, Departments and Agencies (MDAs) and the National Development Planning Commission (NDPC) at the national level.

183. The NDPC regulates the preparation of Medium-Term Development Plans (MTDPs) by issuing out guidelines to planning authorities (MDAs, RCCs and MMDAs). These guidelines typically, define areas of national policy, priorities and strategies for the medium term (mainly derived from the current national development agenda); provides the framework for deriving sector, regional and district goals, objectives, priorities and strategies; defines the scope and format of the district plans to enhance regional harmonization.

184. As prescribed the District Planning process provides a "bottom-up" complement to broad national-level policy objectives and strategies that reflect aspirations of communities, towns and districts. This process is being followed for the preparation of DESSAPs by MMDAs at district level and the NESSAP at the national-level.

2.3.3 The Local Government Service

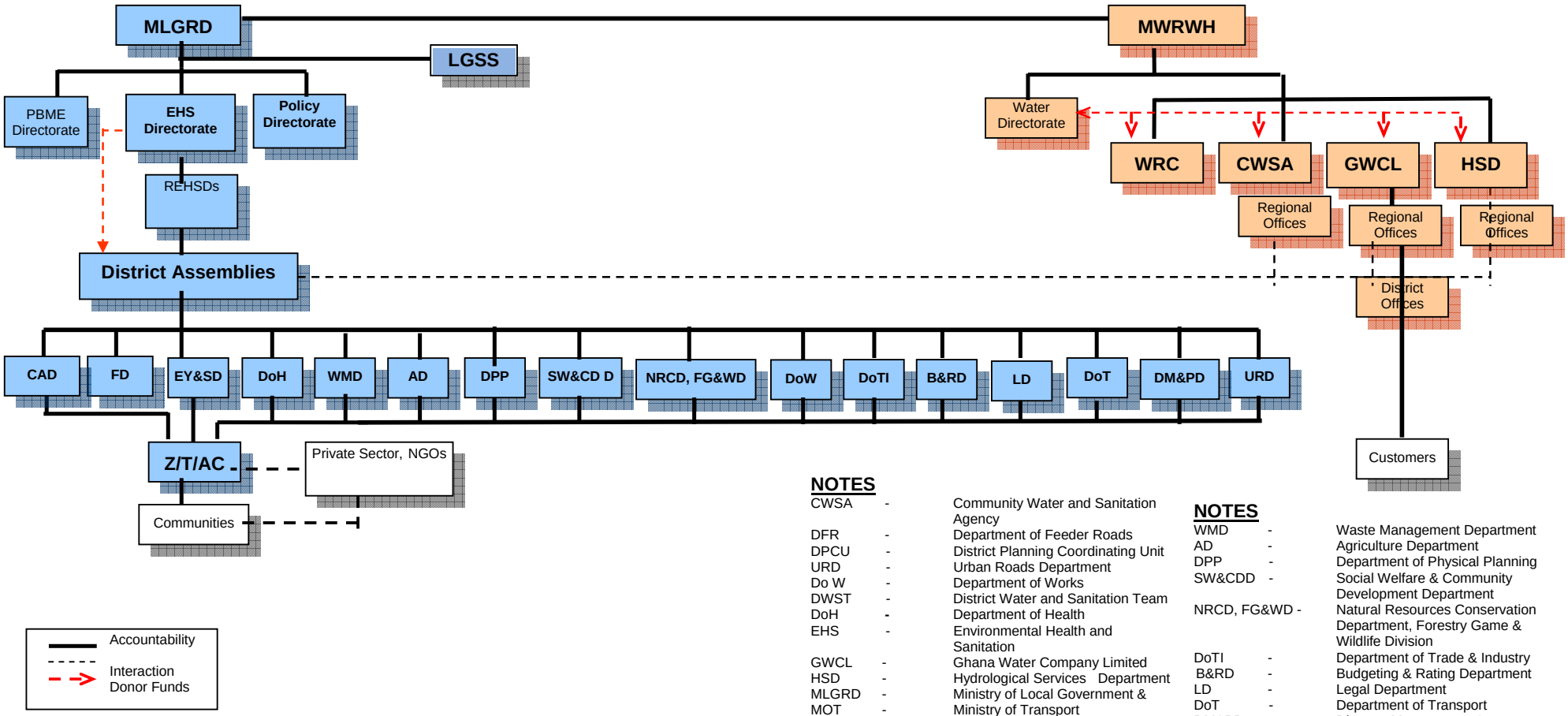
185. The Local Government Service was formally inaugurated in November 2007. It is expected that with the operationalisation of the Local Government Service Act, 2003 (Act 656) key issues and challenges that have stalled decentralisation will be overcome.

186. Act 656 separates the Local Government Service (LGS) representing decentralised institutions and/or agencies (responsible for policy/plans/programmes development and implementation) from the Civil Service (representing central policy/planning agencies).

187. While Act 656 presents an opportunity for making progress towards decentralisation, it does not fully resolve issues of fiscal decentralisation. Indeed all key expenditure items of the LGS (e.g. salaries) shall be a charge on the Consolidated Fund[9]. This has implications for previous efforts at fixing establishment ceilings for MMDAs with the intent that these entities will eventually be able to employ their own key staff and provide MMDCEs with the right incentives to "hire and fire" staff.

[9] Part II, Section 28, Local Government Service Act, 2003 (Act 656)

Figure 2.3: Organizational collaboration between agencies for delivering aspect of environmental sanitation services



NOTES

CWSA	-	Community Water and Sanitation Agency
DFR	-	Department of Feeder Roads
DPCU	-	District Planning Coordinating Unit
URD	-	Urban Roads Department
Do W	-	Department of Works
DWST	-	District Water and Sanitation Team
DoH	-	Department of Health
EHS	-	Environmental Health and Sanitation
GWCL	-	Ghana Water Company Limited
HSD	-	Hydrological Services Department
MLGRD	-	Ministry of Local Government &
MOT	-	Ministry of Transport
MWRWH	-	Ministry of Water Resources, Works & Housing
PBME	-	Planning Budgeting, Monitoring & Evaluation
REHSU	-	Regional Environmental Health and Sanitation Unit Rural Development
WRC	-	Water Resources Commission
Z/T/AC	-	Zonal, Town & Area Council
CAD	-	Central Administration Department
FD	-	Finance Department
EY&SD	-	Education Youth & Sports Department

NOTES

WMD	-	Waste Management Department
AD	-	Agriculture Department
DPP	-	Department of Physical Planning
SW&CDD	-	Social Welfare & Community Development Department
NRCD, FG&WD	-	Natural Resources Conservation Department, Forestry Game & Wildlife Division
DoTI	-	Department of Trade & Industry
B&RD	-	Budgeting & Rating Department
LD	-	Legal Department
DoT	-	Department of Transport
DM&PD	-	Disaster Management & Prevention Department
LGSS	-	Local Government Service Secretariat

Local Government Departments, LI 1961, 2009

Figure 2.4: Organizational Structure of the Environmental Health and Sanitation Directorate of MLGRD

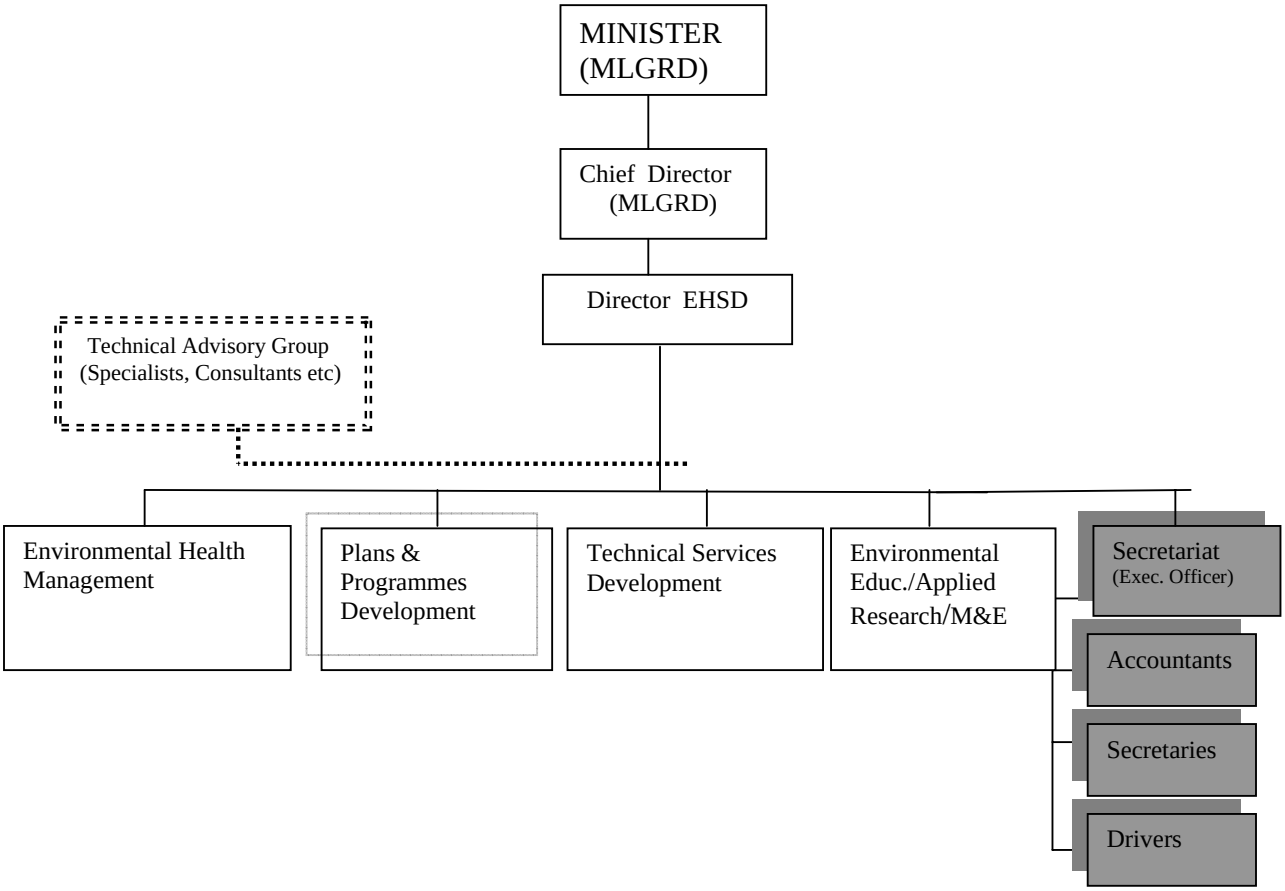


Figure 2.5: Structutre of waste management department in Metropolitan Assemblies

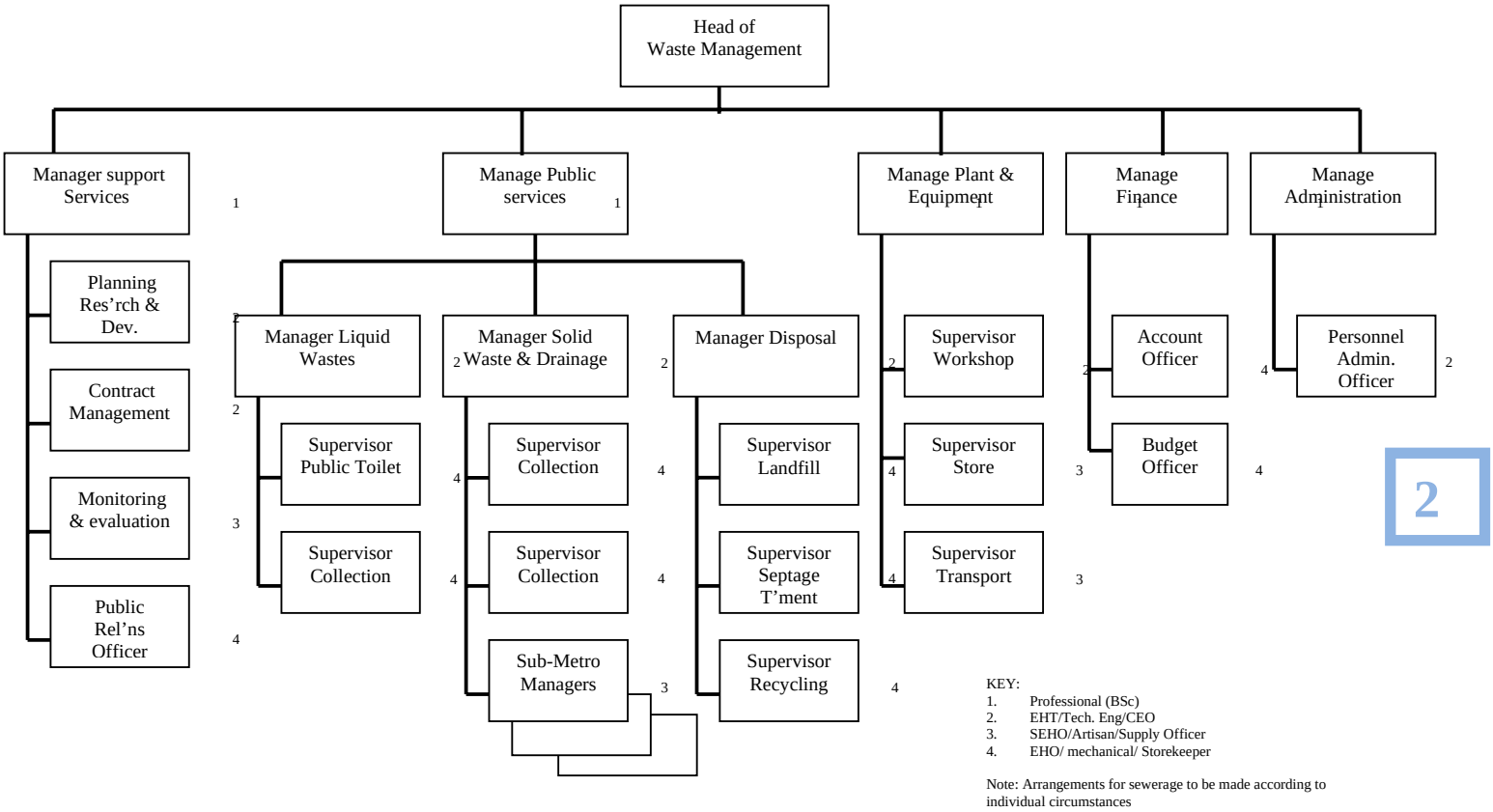


Figure 2.6: Structure of waste management department in Municipal Assemblies

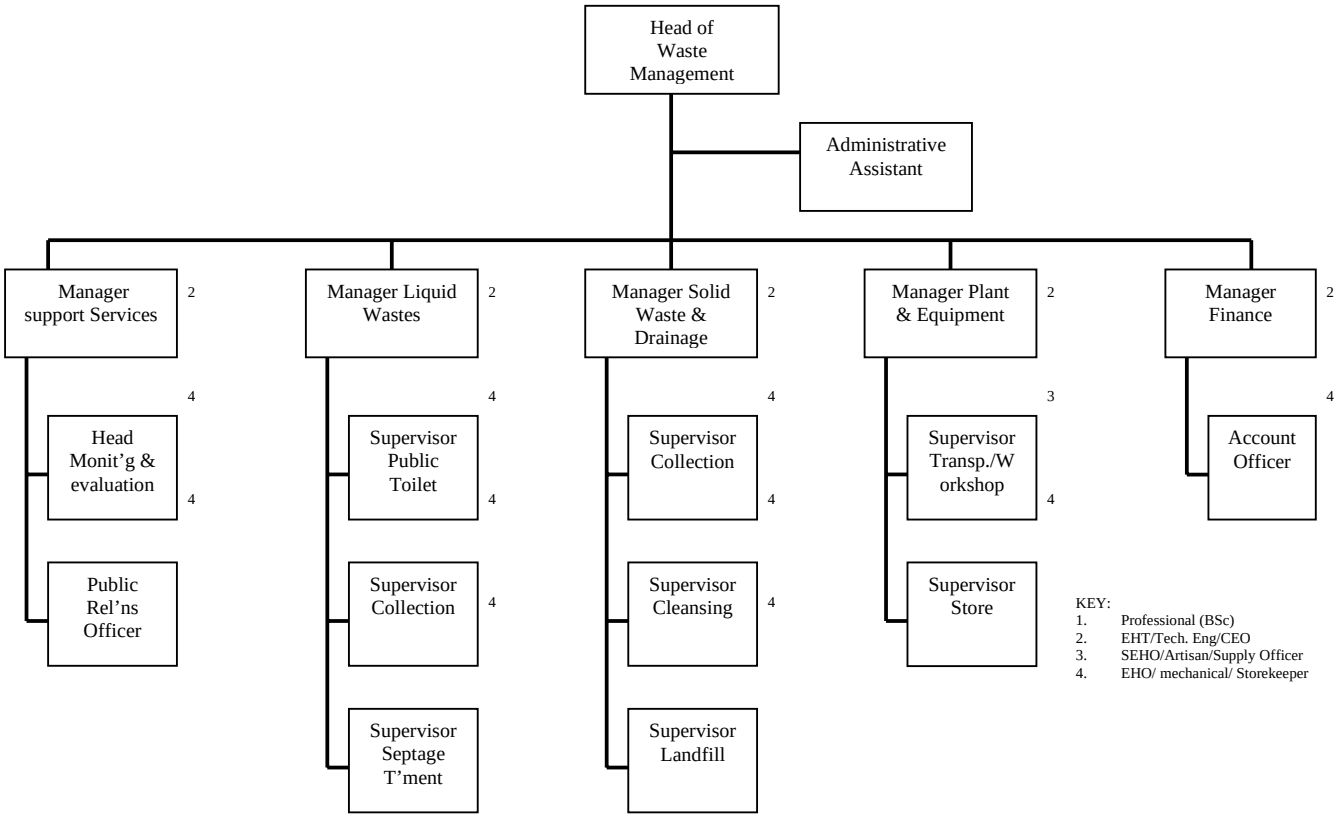


Figure 2.7 Structure of Metro/Municipal Environmental Department

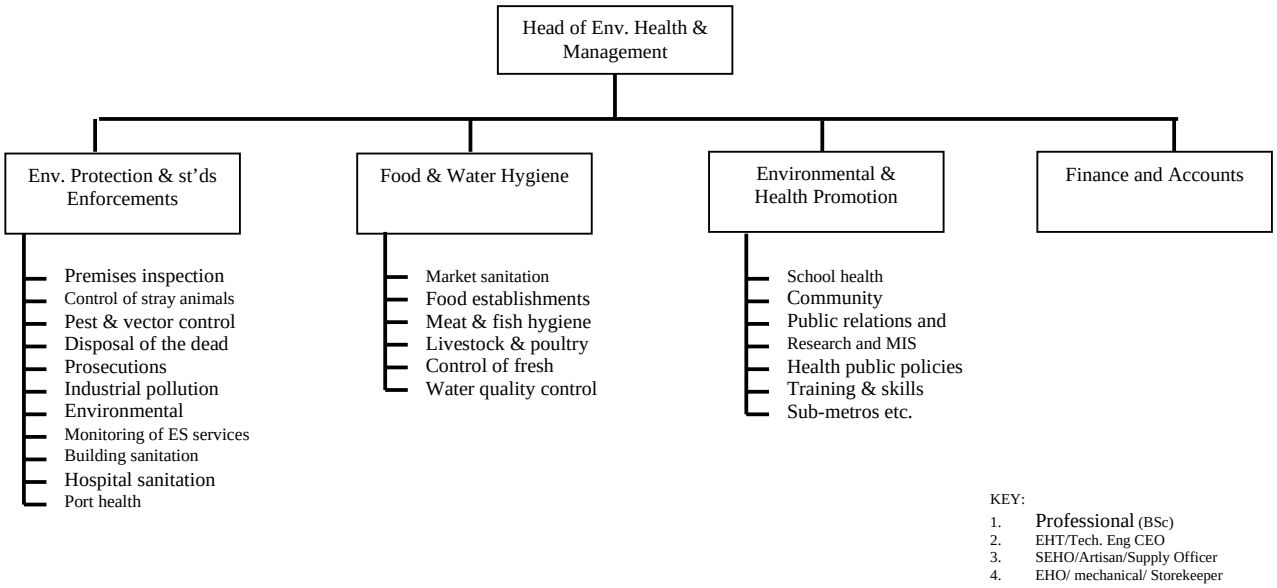
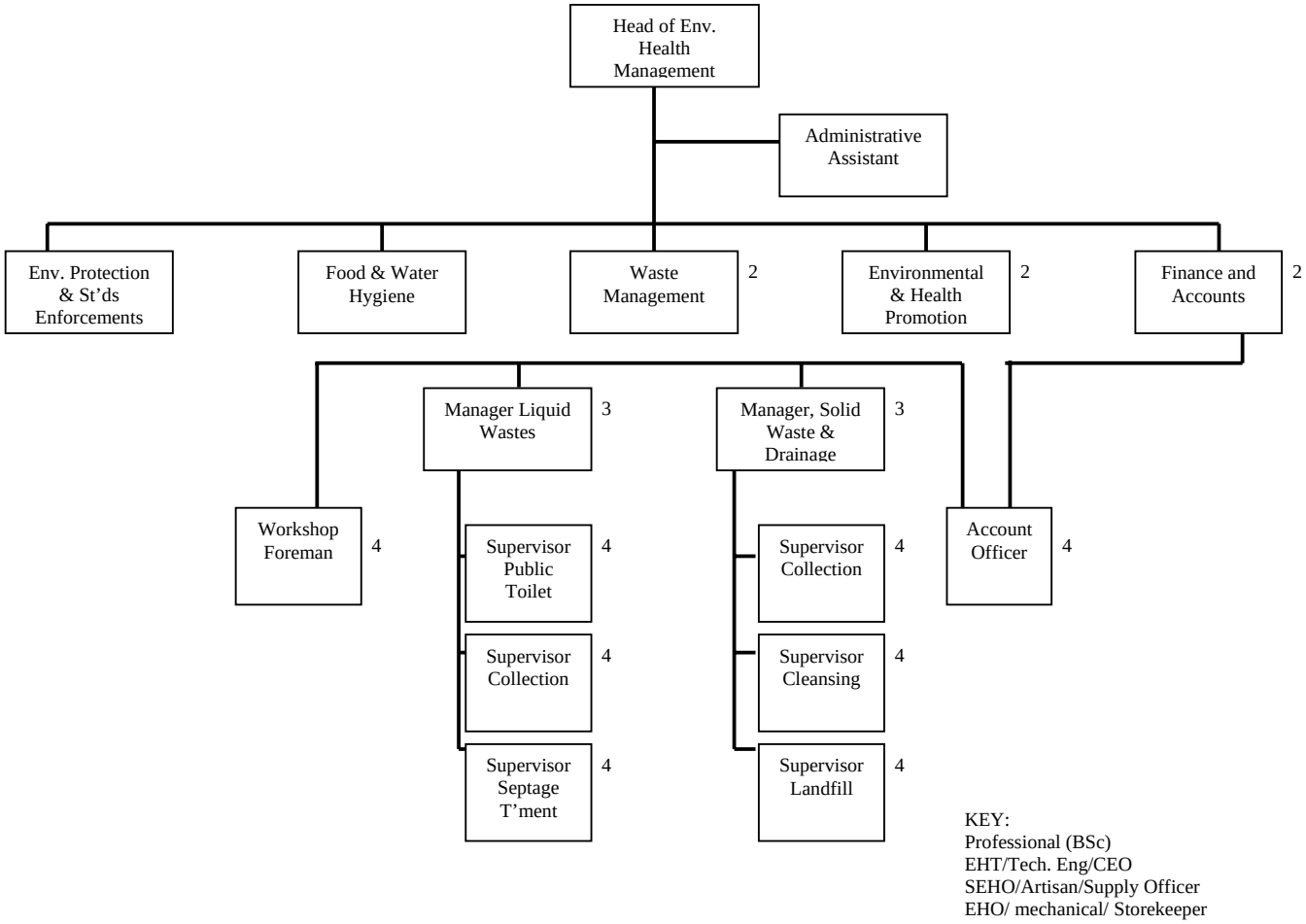


Figure 2.8: District Environmental Health and Management Department



3 Current State of Environmental Sanitation

3. Current State of Environmental Sanitation

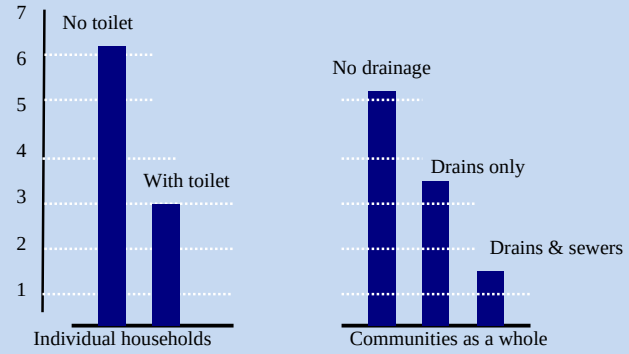
188. There has not been consistent collection and collation of data on all the components of environmental sanitation as defined in the Environmental Sanitation Policy (Revised, 2009). At best reportage on coverage has been limited to bulk solid waste collection and disposal and "sanitation" coverage limited to provision of facilities for "hygienic disposal of human excreta" mainly at household and communal/public levels.

189. The focus on all the components of environmental sanitation at this time is justified as there is the need to do more than narrowly promoting hygiene and improved latrines (or toilets) alone.

190. Evidence abound that large scale improvement in all components across the entire community is the only means of drastically reducing and/or eradicating all the commonly encountered tropical diseases.

191. Figure 3.1 shows the combined effects of improving drainage and excreta management on diarrheoa episodes. Indeed one of the key source prevention strategies for malaria is the provision, and proper maintenance management of drains for collection of storm-water and sullage.

Figure 3.1: Benefits of Investments in Communal Environmental Sanitation go beyond Toilets (Sources Human Development Report, UNDP 2006)



Diarrhoeal episodes per child per year in favelas in Salvador, Brazil, 1989-90

192. Therefore an important feature of the NESSAP is to cover all the key aspects of environmental sanitation, as a first step. The adoption of key proven participatory methodologies and social marketing techniques is another important feature for raising awareness for improving sanitation-behaviour and practices.

193. In this way it is anticipated that the NESSAP will not only take care of the targets of the Millennium Development Goals but also prepare the grounds for achieving "total sanitation" as a logical next step beyond 2015.

194. The situational analysis reported in this chapter is derived from many sources including review of project documents, the 2000 Census report, updates from Annual Performance Reviews (APRs) of the GPRSII and Micro-Cluster Indicator Report (2006) and Demographic and Housing Survey reports.

195. The information provided reflects the different levels of detail of available data for the various components of environmental sanitation. The quality of information differs from one component to the other. It is expected that as Metropolitan, Municipal and District Assemblies (MMDAs) complete their DESSAPs the quality of information

will improve over several rounds of review and update of DESSAPs and the NESSAP.

3.1 Overview of Solid Waste Management

196. Poor solid wastes management with its immediate and visible impact remains one of the major challenges to the MLGRD and many Chief Executives of MMDAs. According to the 2000 Housing and Population Census 4.8% of households have their waste collected directly from their dwellings, 7.9% burn their household refuse, and 57.6% use various household receptacles for storage and send it to designated public dumps including communal-container stations or sanitary sites. It is reported that 3.9% of households bury their refuse while 25.9% dump at unspecified locations including vacant lots, drains, embankment of water courses, rivers, lakes and wetlands. In total, close to 85% of all refuse generated is currently not collected and disposed of in a proper manner.

3.1.1 Sources of Municipal Solid Wastes

197. Ghana's six largest cities (Accra, Kumasi, Tamale, Takoradi, Ashaiman and Tema) account for about 19% of the total population and their residents generate an estimated 3,200 tonnes of solid waste per day. There are 115 other urban localities each with population above 15,000 with environmental sanitation challenges within their core areas similar to those of the large cities. These other urban localities comprising 15.9% of the total population also generate about 5,000 tonnes each day. Table 3.1 gives the waste generation data for the five largest cities.

Table 3.1: Municipal Solid Waste Data for 5 Largest Cities, 2004-2010

Characteristics	Accra	Kumasi	Sekondi-Takoradi	Tamale	Tema	All cities
2004						
Population, thousand *	1,904	1,343	348	228	437	4,260
MSW generated, kg/capita/day	0.79	0.82	0.68	0.66	0.59	0.76
MSW generated, tons/day	1,500	1,100	236	150	260	3,246
MSW collected, tons/day	950	850	170	85	155	2,210
Percent collected	63%	77%	72%	57%	60%	68%
Collection cost, US$/ton	10.0	8.0	7.0	6.0	8.0	7.8
Disposal cost, US$/ton	2.0	1.0	-	-	-	1.5
Total cost, US$/ton	12.0	9.0	7.0	6.0	8.0	8.4
2010						
Population, thousand *	2,340	1,651	404	272	537	5,204
MSW generated, kg/capita/day	0.80	0.80	0.70	0.70	0.70	0.75
MSW generated, tons/day	1,872	1,321	283	190	376	4,042
MSW collected, tons/day	1,498	1,123	226	124	263	3,233
Percent collected	75%	85%	80%	65%	70%	80%
Collection cost, US$/ton	10.0	8.0	7.0	6.0	8.0	7.8
Disposal cost, US$/ton	3.0	2.0	2.0	2.0	1.5	2.1
Total cost, US$/ton	13.0	10.0	9.0	8.0	9.5	10

Source: Project Appraisal Document– World Bank Urban Environmental Sanitation Project (Phase 2), Nov. 2004.

198. Figure 3.2 give an estimated proportion of the various categories of solid waste streams for Ghana. Table 3.2 shows composition of typical household refuse.

Table 3.2: Solid Waste Characteristics for Three Income Groups in Kumasi

	Low income group	Middle income group	High income group
Components	% by weight	% by weight	% by weight
Organic	48	56	71
Plastic	8	5	6
Paper	2	2	4
Metals	2	1	2
Glass	1	2	2
Wood	2	1	1
Textile	3	6	2
Miscellaneous	34	27	12
Total	100	100	100

Source: Comparative analysis of household wastes in the cities of Stuggart and Kumasi-option for waste recycling and treatment in Kumasi. Proceedings of 19th International CODATA Conference Berlin, 7-10th November, pp1-8). Ketibuah et al, 2004 (Reference: Ketibuah E, Asaase M, Yusif S, Mensah MYand Fischer K (2004).

199. An estimation of the proportion of solid waste from major sources of generation is shown in Figure 3.2. The composition of refuse is indicated in Figures 3.3 and 3.4.

Figure 3.2:Estimation of Promary Souraces of Solid Waste

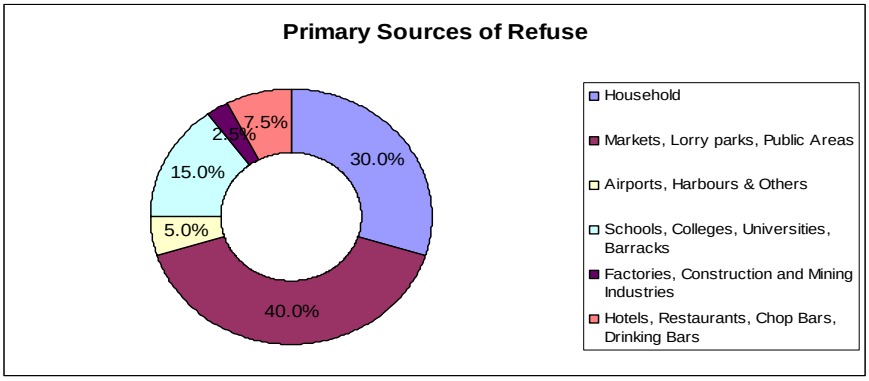


Figure 3.3 Average Composition by volume of Solid Waste Stream, GAMA. (Baseline Surveys, MMDAs, 2008)

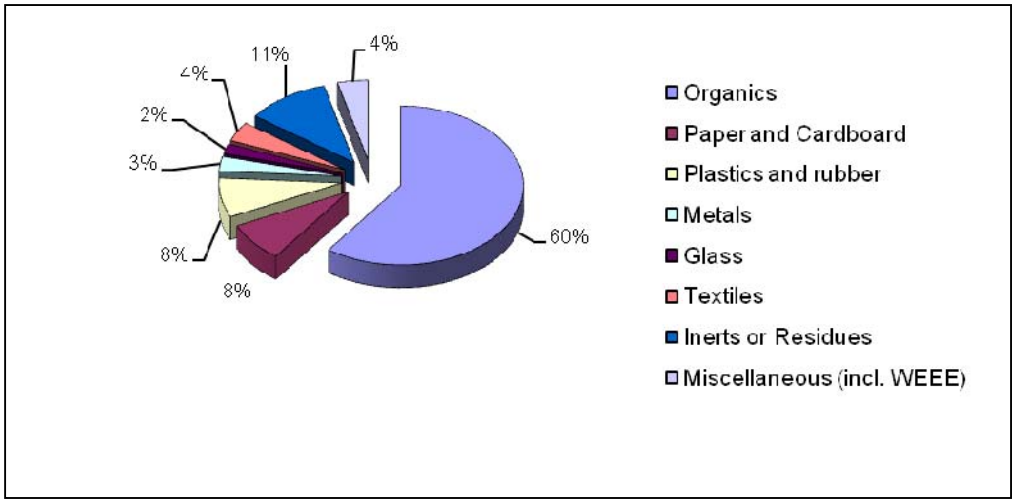
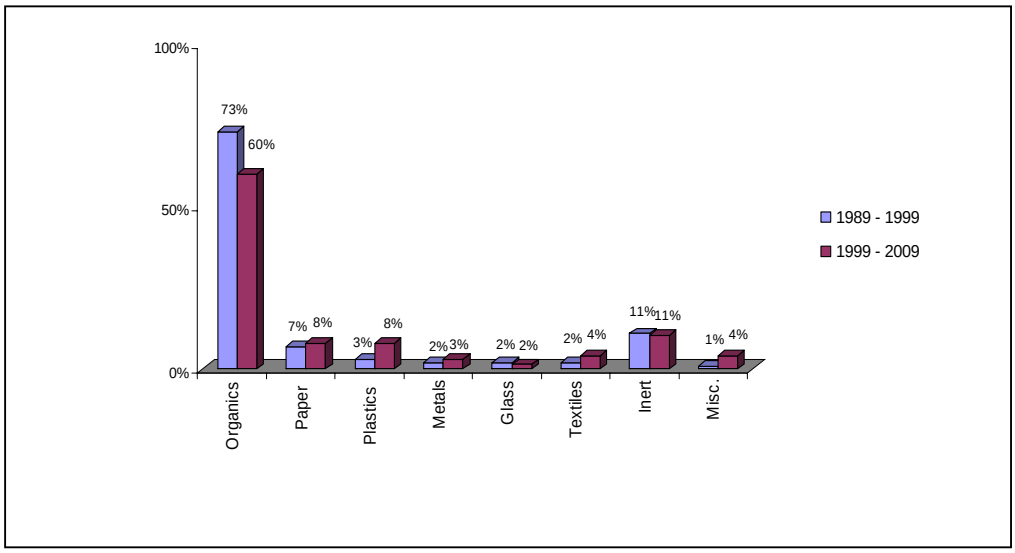


Figure 3.4 Varying Composition by Volume of Solid Waste Stream, GAMA. AMA (2004), Baseline Survey, MMDAs, 2008)



3.1.2. Solid Waste Collection and Transport

200. Table 3.3 gives the national and regional averages of household solid waste collection recorded from the 2000 Housing and Population Census report.

Table 3.3: Coverage of Refuse Collection and Disposal (National and Regional Averages), 2000

	Household Solid Waste Disposal by Method (%)					
	Collected	Burned	Public dump	Dumped elsewhere	Buried	Other
National	**4.8**	**7.9**	**57.6**	**25.0**	**3.9**	**0.9**
WESTERN	**2.2**	**4.6**	**59.6**	**28.6**	**34.6**	**4.0**
CENTRAL	**0.8**	**6.4**	**69.3**	**19.9**	**2.6**	**0.9**
GT. ACCRA	19.5	12.2	51.4	11.5	4.6	0.7
VOLTA	2.4	12.9	46.5	31.6	5.8	0.8
EASTERN	2.2	10.1	56.5	25.2	5.2	0.9
ASHANTI	1.3	3.3	78.9	13.4	2.6	0.4
BRONG AHAFO	0.9	3.4	70.3	22.6	2.4	0.4
NORTHERN	2.1	9.4	30.4	55.3	2.5	0.3
UPPER EAST	3.3	16.4	13.2	55.2	5.7	6.2
UPPER WEST	2.3	4.6	21.1	65.6	6.0	0.3

Source: Facts Sheet No. IV, National Population Council, 2006.

201. Table 3.4 gives the national and regional averages of household solid waste collection recorded from the baseline data collected by MMDAs.

Table 3.4: Coverage of Refuse Collection and Disposal (National and Regional Averages), 2008

Communal Solid Waste Disposal by Method (%)							
	Buried	**Burned**	**House-to-House Collection**	**Communal Container**	**Crude/ Indiscriminate Dumping**	**Public Dumps**	**Other**
NATIONAL	3.7	16.9	2.2	4.1	58.9	2.5	11.7
ASHANTI	8.2	13.3	5.3	12.6	51.6	9	0
BRONG AHAFO	3.2	15.3	0	1.7	76.2	2.3	1.3
CENTRAL	0.5	4.2	0	2.9	86.3	5.5	0.6
EASTERN	0.4	16.5	0	12.5	66.4	4.2	0
GT. ACCRA	1.5	20	23	16.4	38.5	0	0.6
NORTHERN	2.8	18.8	0	0.5	69.2	0	8.7
UPPER EAST	0	24.8	0	0	36.2	0	39
UPPER WEST	19.3	31.3	0	1.5	35.8	0	12.1
VOLTA	0.4	6.1	0	1.2	77.1	6.7	8.5
WESTERN	1.2	1.8	4.6	12.2	79.6	0.4	0.2

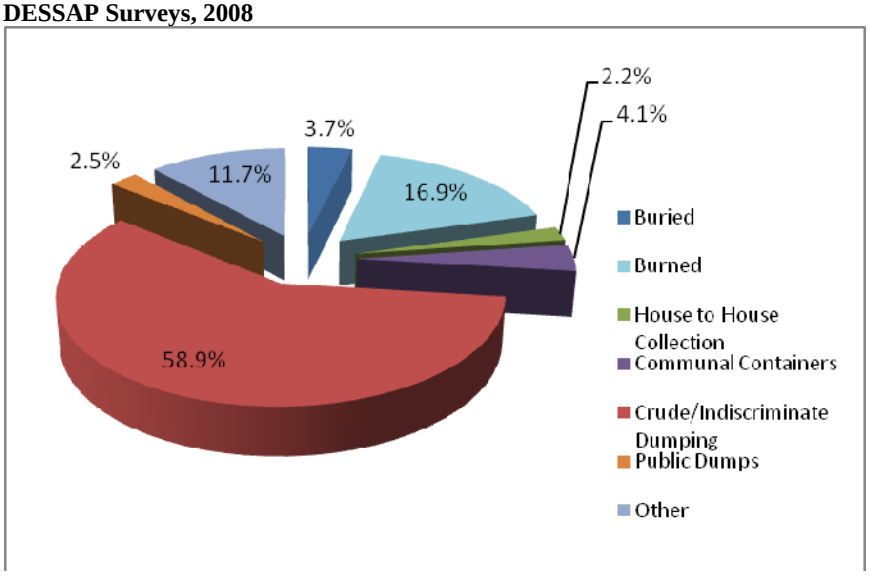
Source: DESSAP Field Survey, EHSD/MLGRD, 2008.

202. The above table indicates that about 2.5% of households have house-to-house services (or variations such as kerbside collection). A large proportion, close to 60%, of households relies on communal or public dump as well as secondary storage at communal sanitary sites with communal containers (or skips) which are not emptied frequently in many instances.

203. Available data for Ghana's five largest cities show that projected collection and transport ratios (waste collected and transported to disposal/waste generated) for refuse is gradually improving over the last few years. Estimates for 2010 are as follows: Accra 75%, Kumasi 85%, Sekondi-Takoradi 80%, Tamale 65% and Tema 70% (MMDA/MLGRD-UESP II).

204. From the baseline environmental sanitation data gathered in 2007/8 by MMDAs close to 76% of households still rely on improper waste collection and disposal methods. Figure 3.5 shows the different collection and disposal methods.

Figure 3.5: Estimation of Solid Waste Collection and Disposal Methods, MMDAs DESSAP Surveys, 2008



3.1.3 Treatment and Disposal of Solid Waste

205. The poor disposal of refuse both in communities and its management at final disposal sites remain an intractable challenge faced by all MMDAs. The Medium term Development Policy Framework (2010 – 2013) has recommended the provision of improved disposal for wastes as a key strategy for improving services.

206. Crude, open dumping is the practice in almost all communities. In the few cases where controlled-dumping is practiced, environmental impact whether immediate or long-term are ignored. Implementing improved site management procedures is often only in reaction to public outcry and threat of closure of operations by nearby communities.

207. Kumasi and Tamale are the only cities with engineered landfills. In Kumasi basic operation and maintenance management procedures required for a sanitary landfill are not adhered to on routine basis owing to costs and poor enforcement of operational standards. Accra has no engineered landfill site and refuse is disposed in abandoned quarries in adjoining districts of Ga West and Weija, while city authorities continue to grapple with resistance from nearby communities over a planned disposal site at Kwabenya in Ga East District, which has not progressed beyond initial site preparatory works that cost almost $2 million.

208. From the baselines data collected by MMDAs only a very small number of MMDAs have taken steps to start the process of siting and/or acquisition for treatment and disposal sites although this has been listed as priority areas in the GPRSI/II. The MTDPF (2010 – 2013) has repeated this need.

3.2 Overview of Excreta Management

209. Excreta management covers the "hygienic disposal of human excreta" including the use of on-site and off-site systems including pit latrines, VIPs, K-VIPs, WC/Septic Tanks, Aqua Privies, and variations of ecological sanitation (commonly referred to as ecosan, eco-toilets) facilities, and waterborne sewerage systems. These commonly found options are for both household-level and communal use (public toilets).

3.2.1 Household Access to improved sanitation (by technology options)

210. From the 2000 Housing and Population Census, about 31% of households rely on public toilets mainly WCs, KVIPs and Aqua Privies, while 22% have access to pit latrines of varied level of improvements. About 7% of households use KVIPs and 9% have access to flush toilets (water closets connected to cesspits and septic tanks mostly without drain fields). The use of unhygienic and health-threatening pan (or bucket) latrines still exist accounting for about 4% of household usage, especially in government quarters including those belonging to Police, MoH and RCCs.

211. The national average for sewerage coverage is as low as 4.5%. Tema and Akosombo are the only townships with a comprehensive sewerage system. Accra has a sewerage system covering the State House and ministries area and parts of the Central Business District with low property connections. There are also a number of satellite sewerage systems for Dansoman, Teshie Nungua, Burma Camp, University of Ghana, Legon, Achimota School, 37 Military Hospital and Ridge areas. The treatment facilities for both the Accra and Tema systems have broken down and not in use.

212. Kumasi has limited sewerage covering the 4BN Barracks, Komfo Anokye Teaching Hospital and the Kumasi Golden Tulip City Hotel. Another system, the Asafo simplified sewerage serves about a population of 20,000 people living in 120 tenement housing blocks.

Table 3.5: Average Coverage Data for Sanitation in Regions

Western Region	50%	Ashanti Region	65%
Central Region	55%	Brong Ahafo Region	45%
Greater Accra Region	80%	Northern Region	20%
Volta Region	35%	Upper Eastern Region	10%
Eastern Region	60%	Upper Western Region	20%

Source: GSS, 2000 Population and Housing Census; figures include shared facilities.

213. The data in Table 3.5 give a national average coverage estimate of 55%. While there are discrepancies in the sanitation coverage data, the key issues to note is the wide variations in sanitation coverage between the southern and northern regions - only 10% in Upper Eastern Region, for example as against 80% for the Greater Accra Region. These variations are taken into account in the NESSAP strategies and action plans. For example, the reported 80% for Greater Accra also includes public toilets (almost 30%) and shared facilities (about 10%).

Table 3.6: Use of Sanitary Means of Excreta Disposal (MICS 2006)

Percent distribution of household population according to type of toilet used by the household and the percentage of household members using sanitary means of excreta disposal, Ghana, 2006

	Type of toilet facility used by household											
	Improved sanitation facility					Unimproved sanitation facility						
	Flush to piped sewer system	Flush to septic tank	Flush to pit (latrine)	Ventilated Improved Pit latrine (VIP)	Pit latrine with slab	Pit latrine without slab/open pit	Bucket	No facilities or bush or field	Missing	Total	Percentage of population using sanitary means of excreta disposal *	Number of household members
Region												
Western	0.5	8.2	0.4	29.5	37.3	11.3	0.0	12.8	0.0	100.0	75.9	2,451
Central	1.4	5.9	1.0	29.6	24.8	17.9	1.3	18.1	0.0	100.0	62.7	2,024
Greater Accra	5.4	19.6	13.0	36.3	11.0	5.4	0.8	8.1	0.3	100.0	85.4	3,911
Volta	0.9	2.9	0.7	25.5	8.9	30.1	0.3	30.8	0.0	100.0	38.8	1,978
Eastern	1.3	3.3	0.5	24.2	20.3	42.0	2.9	5.5	0.0	100.0	49.6	3,099
Ashanti	4.1	9.9	0.6	46.4	26.1	9.0	0.5	3.4	0.1	100.0	87.0	3,854
Brong Ahafo	0.6	1.4	0.6	40.4	36.0	14.5	0.0	6.4	0.0	100.0	79.1	2,295
Northern	0.0	0.5	0.8	19.7	4.1	1.1	0.9	72.9	0.0	100.0	25.1	3,549
Upper East	0.0	0.4	0.0	11.3	5.7	0.6	0.0	81.9	0.0	100.0	17.5	1,134
Upper West	0.0	6.0	0.2	6.6	4.5	3.4	0.0	78.7	0.7	100.0	17.2	652
Residence												
Urban	3.8	14.9	5.3	46.5	12.0	7.0	1.7	8.7	0.1	100.0	82.6	10,315
Rural	0.6	1.2	0.6	19.0	23.8	19.0	0.2	35.5	0.1	100.0	45.3	14,632
Education of household head												
None	0.4	1.8	0.7	22.8	14.7	12.4	0.0	47.1	0.0	100.0	40.4	8,832
Primary	0.4	4.5	1.2	30.4	24.6	17.5	0.8	20.4	0.4	100.0	60.9	3,327
Middle/JSS	1.9	7.0	2.4	37.1	23.7	16.4	1.3	10.1	0.1	100.0	72.1	8,665
Secondary+	6.6	19.6	7.8	32.6	13.3	9.7	1.4	9.0	0.0	100.0	79.9	4,123
Wealth index quintiles												
Poorest	0.0	0.0	0.0	1.3	15.7	15.6	0.0	67.4	0.0	100.0	17.0	4,992
Second	0.0	0.0	0.0	16.4	29.4	24.2	0.0	30.0	0.1	100.0	45.7	4,984
Middle	0.3	0.8	0.6	43.6	22.8	17.4	0.5	13.7	0.3	100.0	68.1	4,991
Fourth	1.2	5.4	2.2	53.3	18.7	9.2	1.6	8.3	0.1	100.0	80.9	4,995
Richest	8.1	28.2	9.9	37.4	8.1	3.6	2.0	2.6	0.0	100.0	91.7	4,986
Total	1.9	6.9	2.6	30.4	18.9	14.0	0.8	24.4	0.1	100.0	60.7	24,947

** MICS Indicator 12; MDG Indicator 31*

Source: Ghana Multiple Indicator Cluster Survey 2006, Monitoring the situation of children, women and men. Ghana Statistical Service, 2006.

214. The World Health Survey (WHS) 2003 provides data on use of facilities disaggregated for urban and rural as well as for private premises and public facilities. The WHS2003 gives the proportion of households using improved sanitation facilities as 26.6% and 10.7%[10] for urban and rural respectively.

215. The Multiple Indicator Cluster Survey (2006) indicated that sixty-one percent (61%) of the population is using improved variety of household latrines ranging from flush toilets connected to sewer or septic tanks, VIP latrines and pit latrines with slabs. It also reported a high percentage of usage of improved facilities in urban areas (about 83%) as against less than 45% for rural areas. It is important to note that the *data reported in the MICS report does not disaggregate data into household-level and public facilities*.

216. From the MICS report a majority of households in Upper East, Upper West and Northern regions have no toilets and resort to use of the bush. Table 3.6 above gives the details of reported access to improved facilities from the MICS report.

217. Another important finding of the MICS 2006 is the link between education status of household heads and access to improved facilities. The higher the status the more likely the provision of improved facility at household level. The 2008 Annual Progress of the GPRSII reported progress on water and environmental sanitation based on the data from the MICS survey.

218. Data from the draft report on 5th Round of the Ghana Living Standards Survey (GLSSV) gives coverage of 26.6% and 21.9% in 2006 for urban and rural areas respectively (Table 3.7). It is significant to note that of the improved variety of toilet, flush toilets constitute a large proportion. A trend that shows increasing use of WC-Septic tanks.

Table 3.7: Distribution of Household by Locality and Type of Toilet Facility, 2006

Type of facility	Urban	Rural
Flush toilet	22.2	10.2
Pit latrine	15.7	31.5
KVIP Latrine	14.4	11.7
Pan/Bucket Latrine	2.6	1.3
Public toilet	38.7	24.4
Toilet in another house	1.0	1.4
No toilet facility (bush/beach)	5.3	19.4
Other	0.0	0.1
Total	100.0	100

Source: GSS, GLSSV, Draft Report, 2007 in APR 2007 GPRSII-NDPC, June 2008

219. The Ghana Demographic and Health Survey (DHS 2008) gave a coverage of improved sanitation facilities of 11.3% and as shown in Table 3.8. The DHS 2008 did not separate data for "public" and "shared" facilities and so did not allow further analysis of proportion of the population relying solely on public facilities.

[10] The World Health Survey 2003 captured improved latrines with slab but none of Ventilated-Improved-Pit variety.

Table 3.8: Distribution of Household Sanitation Facilities

Percent distribution of households and de jure population by type of toilet/latrine to residence, Ghana 2008

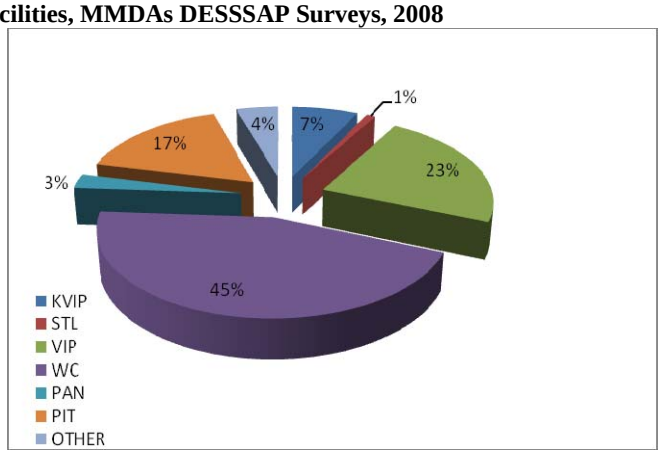
	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility	**15.6**	**7.3**	**11.3**	**17.8**	**8.2**	**12.4**
Flush/pour flush to piped sewer system	2.2	0.6	1.4	2.6	0.5	1.4
Flush/pour flush to septic tank	8.8	0.9	4.7	9.7	1.0	4.8
Flush/pour flush to pit latrine	2.0	0.2	1.1	2.1	0.2	1.0
Ventilated improved pit (VIP) latrine	1.9	1.9	1.9	2.6	2.2	2.4
Pit latrine with slab	0.7	3.6	2.2	0.8	4.2	2.7
Composting toilet	0.0	0.1	0.0	0.0	0.1	0.1
Non-improved facility	**84.3**	**92.8**	**88.8**	**82.1**	**91.8**	**87.7**
Any facility shared with other households	72.2	48.6	59.9	68.8	42.3	53.9
Flush/pour flush not to sewer/septic tank/ pit latrine	0.1	0.0	0.1	0.1	0.0	0.1
Pit latrine without slab/open pit	4.1	14.0	9.3	4.0	13.6	9.4
Bucket	2.0	0.3	1.1	1.8	0.2	0.9
No facility/bush/field	5.6	29.5	18.1	7.2	35.4	23.1
Missing	0.3	0.4	0.3	0.2	0.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	5,627	6,150	11,777	19,262	24,818	44,080

Source: Ghana Demographic and Health Survey, 2008

220. From baseline data gathered by District Environmental Health Directorates country-wide in 2007 and 2008, the proportion of facilities used by households is as shown by Figure 3.6. It presents a coverage figure of 76% for use of improved options (WC, VIP, Aqua Privies, and K-VIP[11]).

[11] The high coverage data reported by the EHSD-MMDA (DESSAP) survey suggests that households visited are in predominantly urban communities following a pattern of the routine premises inspection of Environmental Health Officers.

Figure 3.6: Estimation of Household Use of Excreta Disposal Facilities, MMDAs DESSSAP Surveys, 2008



221. The data re-affirms the trend in the high proportion of flush toilets, particularly for urban areas. The collated data also show significant differences across regions and districts. The details of regional variations are indicated in Annex 2, Table A2.1

222. A comparison of reported coverage in the WHS2003 and the fifth Ghana Living Standards Survey (GLSSV, 2007) suggests that coverage has increased by about 10% for rural areas over the period while that for urban has remained at the same levels (see Table 3.7). The rapid growth in urban population partly accounts for the deterioration in urban areas.

223. Using the GLSSV data as the basis, a 2015 NESSAP target of 61% and 68% coverage is calculated for rural and urban respectively. Based on this, it is estimated that an additional 10.5 million people will need to be served with improved household sanitation facilities by 2015 (See Table 3.9).

Table 3.9: Sanitation Coverage and Requirements to meet MDG and NESSAP Targets

Population Segment	2006			2015		
	Estimated total population (x1000)	Population with Access to Improved Sanitation (x 1000)	Percentage with Acess to improved sanitation (%)	Estimated total population (x 1,000,000)	NESSAP Target	Additional population to be covered to reach NESSAP Target[2]
Rural	11,649.00	2,551.13	21.9%	13.00	61%	5.45
Urban	10,731.00	3,927.55	36.6%	13.60	68%	5.04
Total	22,380.00	6,478.68	28.9%	26.60	65%	10.49
1. MDG Target uses 1990, NESSAP uses latest available disaggregated data from GLSSV, 2006.						
2. Adjusted for population growth and deficits in meeting annual provision of improved facilities.						

Source: GLSSV, Ghana MDG Costing and Finance Spreadsheet, WHS 2003, UN Population Statistics, http:///www.wssinfo.org

3.2.1 Excreta Treatment and Disposal Technologies

224. Treatment of wastewater in all regions is very abysmal. The trend in housing types is changing with increasing urbanization and expansion of medium – to high-income housing types. This presents a challenge of effectively managing increasing volumes of sewage as many of these houses have on-plot septic tanks without adequate drain fields. The overflow of septage from septic tanks into drains and water courses further pollutes the immediate environment, with the result that most drains meant for stormwater and sullage conveyance are effectively serving as "open sewers".

225. It is reported that out of 44 sewage treatment plants (including 7 Faecal Sludge and Septage Treatment Plants, FSTPs) treatment facilities only 7 are functioning adequately.

226. The Aerated Lagoons constructed for treating sewage for Tema is in disrepair and sewage is discharged directly through a sea outfall. The Upflow Anaerobic-Sludge Blanket (UASB) plant constructed and commissioned recently (2000) to treat sewage from the Accra Central Sewerage system, septage from septic tanks and faecal sludge from public toilets is also not functioning[12] with sewage by-passed into the Korle-Lagoon close to the sea shore.

227. In Kumasi the sewerage system serving the 4BN, Komfo Anokye Teaching Hospital (KATH) relies on the Waste Stabilization Pond system constructed in 1994 for the treatment of sewage from the Asafo simplified-sewerage system.

228. Satellite estate sewer systems are also located in Chirapatre, Ahinsan and Kwadaso estates. These systems which previously depended mainly on septic tanks and drain fields were rehabilitated in 2001 after more than a decade of neglect and poor maintenance. The Ahinsan and Chirapatre systems have been upgraded to small community waste stabilization ponds.

229. Treatment of liquid waste of pathogenic nature from HCFs is virtually non-existent. In a few hospitals such as those belonging to missionaries, sullage is recycled and used for flushing toilets and then conveyed to anaerobic bio-digesters and co-treated with hospital liquid and pathological waste. St. Dominic's Hospital in Akwatia is a notable example.

230. Generally, those sewerage facilities that are functional are those constructed as satellite systems belonging to corporations such as Volta River Authority (VRA), for example in Akuse, estate developments belonging to the erstwhile State Housing Corporation (now State Housing Company Limited) serving areas such as Dansoman, Ridge, Teshie-Nungua (which's trickling filter is totally in disrepair with sewage flowing through rivulets and drains to the sea).

231. In many instances facilities installed by the erstwhile Public Works Department (PWD) in barracks, schools and hospitals in areas such as Burma Camp, University of Ghana and 37 Military Hospital all in Accra, do not function owing to unclear maintenance responsibilities now that PWD is not directly in charge and sewerage has been transferred to MMDAs. Table 3.10 gives a snap shot of the state of main sewerage systems and septage/faecal sludge treatment plants in Accra, Kumasi and Tema.

[12] Based on visits to the UASB Plant in March 2008.

232. The difficulty of the Accra Metropolitan Assembly's Waste Management Department (AMA-WMD) to operate and maintain[13] the UASB plant inherited from the Ghana Water Company Limited (GWCL), is a common challenge faced by MMDAs including those of Kumasi, Koforidua and Tamale in effectively managing septage/faecal sludge treatment plants (FSTPs). In Kumasi, FSTP co-sited on the engineered disposal site at Dompoase and commissioned in 2003 is not functioning properly with the initial anaerobic/sedimentation ponds choked due to poor operation and maintenance.

233. The difficulty of operating the UASB plant point to still the need for more robust low-cost technologies and better suited systems for handling the problematic high BoD (7500 – 30000 mg/l) of septage/faecal sludge from public toilets used by majority of residents of low-income communities.

234. In the on-going Accra Sewerage Rehabilitation and Expansion Project sponsored by GoG and the African Development Bank (AfDB), Waste Stabilisation Ponds are to be constructed in the Densu Delta to serve the Dansoman sewerage area as well as its immediate environs

Table 3.10: A Snapshot of the Status of Selected Sewerage, Accra, Kumasi and Tema

CITY/ *LOCATION OF SYSTEM*	TYPE OF FACILITY	YEAR	MANAGEMENT RESPONSIBILITY	FINANCING FOR O & M	CONDITION
Accra					
Accra Central Sewerage Scheme	• Con./Sewer Outfall(Sea) • UASB-Trickling Filter/Secondary Clarifier/Sludge Beds	1973 2000	GWSC-ATMA	Sewer Tariff/Govt Subvention	Low-connection. Damaged Outfall Broken down pumps
37 Military Hospital	Trickling Filter/Sedimentation	1972	Min. of Defence/MOH	Govt. Subvention	Broken sewers/reconstruction
University of Ghana(UG)	Trickling Filter + drain fiel11	1967	Health Services, UG	Govt. Subvention	Damaged Filter. Reconstruction
Achimota School	Trickling Filter/Waste stabilization ponds	1968	Ghana Education Service	Govt. Subvention	Damaged Filter. Encroachment
Burma Camp	Trickling Filter + Waste Stabilization Pond	1972	Ministry of Defence	Govt. Subvention	Damaged Filter. Reconstruction
MATS, Teshie	Trickling Filer + Drain field	1972	Ministry of Defence	Govt. Subvention	Damaged Filter. Reconstruction
Labone Estates	Activated Sludger	1974	PWD	Sewer Tariff/Govt	Damaged Filter/Reconstruction
Ministries (Accra Beach)	Activated Sludge	1972	PWD	Govt. Subvention	Damaged. Reconstruction
State House	Activated Sludge	1974	PWD	Govt. Subvention	Damaged. Reconstruction
Mental Hospital	Trickling Filter	1971	MOH/PWD	Govt. Subvention	Damaged. Reconstruction
Accra High School	Activated Sludge	1970	GES/PWD	Govt. Subvention	Damaged. Reconstruction
Roman Ridge	Inhoff Tank	1973	PWD	Govt.	Damaged.

[13] The UASB plant commissioned in 2002 has been dormant since 2004 reportedly due to loss of pressure in pumps that lift to the top of UASB chamber and subsequent detioration of metal parts of key units.

CITY/ *LOCATION OF SYSTEM*	TYPE OF FACILITY	YEAR	MANAGEMENT RESPONSIBILITY	FINANCING FOR O & M	CONDITION
				Subvention	Reconstructed 2004/Additional trickling Filter Bed
Dansoman Estates	Communal Septic Tanks	1975	SHC/AESC Hydro	Min. of Works & Housing /Govt.	Septic Tanks need Rehab.
KorleBu Teaching Hosp	Imhoff Tank + Trickling Filter	1954	MOH/PWD	Govt. Subvention	Rehabilitated 1990
Presec School	Stabilization Pond	1976	GES/PWD	Govt. Subvention	Damaged, need rehab/refitting
Teshie/Nungua Estates	Trickling Filter	1977	SHC/AESC Hydro	MWH/Govt.	Damaged, need Reconstruction
Trade Fair Site, Labadi	Trickling Filter	1972	PWD	MWH/Govt.	Damaged., need Reconstruction
Labadi Beach Hotel	Packaged Plant	1992	Beach Hotel Ltd	Hotel Tariff	Functional
Golden Tulip Hotel	Packaged Plant	1993	Golden Tulip Hotel	Hotel Tariff	Functional
Teshie-Nungua (Fertilizer)	FSTP	1994	AMA-WMD	AMA	Functional
Kumasi					
Teaching Hospital/City Hotel/4BN Barracks	Trickling Filter(1956 - 1962); Oxidation Pond (1962 -	1956	KATH/KMA	Min. of Health/Govt. Subvention	choked /punched sewers/silted up pond. Reconstruction required.
University Campus(KNUST)	Trickling Filter	1967	Health Services (KNUST)	Govt. Subvention	Damaged Trickling filter/pump station
Ahinsan/Chirapatre /Kwadso Low-Cost Housing	Communal Septic Tank-Filter Beds/rehab. Waste stabilization ponds (WSPs)	1975 2002	AESC Hydro/SHC KMA	Community KMA	Communal Septic tanks out of use. New community WSPs
Asafo	Simplified Sewerage/Waste Stabilization Ponds	1994	KMA/Contractor	KMA	Functional, expanded to cater for KATH
Asokore-Mampong Buobai	*FSTP*	2002	KMA	KMA	Out-of-use. Encroachment of buffer zone/filled primary anaerobic ponds.
Oti/Dompoase Landfill	*Septage & Faecal Sludge Treatment Plan*	2004	KMA	KMA	Non-functional primary settling ponds
Tema					
Planned Communities & Industrial Estates	Chemical Treatment (1996 -, Aerated Lagoons)	1973	Tema Devp. Corp.	Tariff/TMA	Damaged Pumping stations, Chem. plant & choked sewers. Rehab. New Aeration lagoons constructed (1996,) – non-functional. Outfall to SEA

Notes: KMA- Kumasi Metropolitan Assembly; AESC - Architectural & Engineering Services Corp.; MOH - Ministry of Health; GES - Ghana Education Service; MWH-Ministry of Works & Housing; PWD-Public Works Department; UST-University of Science &Tech; KATH - Komfo Anokye Teaching Hospital; UG - University of Ghana; TMA - Tema Municipal Assembly.

3.3 Overview of Storm Water Drainage and Sullage Conveyance

235. Historically, responsibilities for drainage have been unclear and divided between Hydrological Services Department (HSD) of the Ministry of Water Resources, Works and Housing (as the lead agency), Ministry of Transport (Departments of Urban/Feeder Roads), and the various MMDAs under the MLGRD. Consequently attention to, and investment for, capital improvements, rehabilitation, maintenance and management have been insufficient.

236. The Local Government Act, 1993 (Act 462), lists drainage as the responsibility of MMDAs. However MMDAs lack the technical capability to design and funds to construct large-scale drainage works. Thus, facilitation and support is mainly provided by the HSD, while agencies of the transportation ministry provide drains as part of road infrastructure.

237. In the past ten years the drainage situation in Ghana's largest cities has improved with the provision of primary drainage infrastructure as part of the Urban Environmental Sanitation Project (UESP) series. Channelisation of 7.5 km of the Odaw River in Accra, 13 km stretch of the Subin River in Kumasi, and improvement of 0.5 km of main Market Circle drain in Takoradi under UESP1 has improved drainage infrastructure in these metropolitan areas.

238. Elsewhere in secondary and medium sized towns, improvements in drainage infrastructure are limited to road-side drains and other appurtenances such as culverts and bridges which are provided to preserve the integrity of constructed roads rather than as intervention to improve conveyance of stormwater and sullage.

239. The overview for Ghana is that there is a dire deficit in drainage infrastructure and urgent action is required if the contribution of improved drainage to communal well-being is to be realized. Haphazard growth has led to uncoordinated development of drainage infrastructure, and so flooding and flood-related loss and destruction of properties, traffic disruption and displacement of persons is a regular occurrence during the rainy season.

240. In urban areas, the poor are affected most, because they reside mostly in low-lying areas adjacent to main storm drains and water courses where land is cheaper or has been informally settled. Increasing urbanization and non-adherence to planning schemes has resulted in unauthorized location of buildings along flood plains and reservations. This is made worse by the increasing area of the built environment which reduces percolation into the soil.

241. The lack of effective refuse collection from premises has also led to the use of drains as refuse disposal receptacles further compounding the problem with drains turned into open sewers with putrid smells.

242. In recent times the occurrence of extreme flooding events and attendant disruptions have been widespread country-wide and left in its wake new dimensions of destruction of crops and threatening food security.

243. Table 3.11 presents data on liquid waste disposal methods by households.

Table 3.11: Disposal of Sullage ("grey water", non-faecal liquid waste), 2000

	Household Liquid Waste Disposal by Method (%)			
	Street Outside	Gutter	Compound	Other
National	**39.0**	**21.1**	**34.6**	**5.3**
WESTERN	**3.2**	**23.7**	**36.6**	**3.1**
CENTRAL	**41.0**	**20.4**	**35.5**	3.1
GT. ACCRA	19.3	38.9	26.7	15.1
VOLTA	41.4	9.6	46.7	2.3
EASTERN	31.6	17.8	48.2	2.5
ASHANTI	39.5	28.4	28.0	4.2
B. AHAFO	54.6	7.3	36.5	1.6
NORTHERN	62.7	8.5	26.3	2.5
UPPER EAST	52.5	6.1	35.7	5.8
UPPER WEST	67.4	4.8	25.0	2.8

Source: 2000 Housing and Population Census, GSS 2000

244. From field surveys carried out as part of preparation of DESSAPs the current situation is as shown in Table 3.12

Table 3.12: Disposal of Sullage ("grey water", non-faecal liquid waste), 2008

	Household Liquid Waste Disposal Method (%)			
	Inside House	Public	Outside House	Shared/ Compound
NATIONAL	60.1%	1.2%	25.9%	12.8%
ASHANTI	70.0%	0.5%	22.9%	6.6%
BRONG AHAFO	66.4%	0.0%	26.8%	6.8%
CENTRAL	42.4%	0.3%	44.2%	13.1%
EASTERN	38.8%	0.0%	47.8%	13.4%
GREATER ACCRA	59.1%	6.1%	28.4%	6.3%
NORTHERN	93.6%	0.1%	5.7%	0.5%
UPPER EAST	47.9%	0.4%	1.7%	50.0%
UPPER WEST	82.2%	0.1%	16.4%	1.4%
VOLTA	40.9%	0.0%	51.7%	7.4%
WESTERN	37.5%	2.7%	40.0%	19.8%

Source: DESSAP Field Survey, EHSD/MLGRD, 2008.

3.3.1 Drainage Plans and On-going Interventions

245. Due to the level of information required on the topography and routes of flow, improvements in stormwater flow depend on full basin surveys. Based on this, stormwater drainage improvements have been carried out through the preparation of drainage master plans[14]. The extent of implementation of these existing master plans indicates a large deficit for drainage improvements.

246. Drainage master plans now exist for the following cities:

- Accra-Greater Accra Region
- Tema- Greater Accra Region

[14] Following the principles of strategic planning as against master planning, the NESSAP recommends immediate actions to solve local problems on the basis of observation and limited local surveys to identify local drainage systems that require immediate improvement without adversely impacting on adjoining basins..

- Kumasi-Ashanti Region
- Takoradi/Sekondi- Western Region
- Tamale- Northern Region

247. Other regional capitals facing serious drainage problems and for which the preparations of drainage master plans are necessary are:
- Ho – Volta Region
- Cape coast – Central Region
- Koforidua –Eastern Region
- Bolgatanga-upper East Region
- Wa- Upper West Region

248. The first drainage master plan for the *Accra Metropolitan Area* was prepared in 1963 by the NEDECO Company of the Netherlands. This covered only the then central business areas of the city. Revisions and extensions of this plan have been carried out to cover the greater part of the city.

249. The following are the main drainage basins within Accra:
i. Densu basin
ii. Lafa basin(including malam drains)
iii. Chemu(including Dansoman and Manponse drains)
iv. Odaw basin(including Nima, Onyasia, Mataheko ,Mukose,and Apenkwa drains)
v. Osu klottey basin
vi. Kpeshie basin(including Kordjor, Napradjor drains)
vii. Mukwoe basin(including Nii-djor drain)
viii. Songo basin

250. The implementation of the drainage master plan for Accra in terms of drainage channel improvement (channel lining) has been very slow. Only about 30% of the channels have been improved. Table 3.13 below shows the extent of drainage development within the Accra.

Table 3.13: Drainafe Basins of Accra and the Extent of Improvement

Basin	DRAIN	% IMPROVEMENT		Total length of drain(km)	Estimated cost for lining(US$M)
		Concrete Lining	Channel Deepening and Widening		
Densu	Densu down stream	Nil	Nil	-	Not yet known
Lafa	Lafa	Nil	50	11.5	9.50
Chemu	Chemu	Nil	70	4.5	2.30
	Manponse	Nil	90	2.1	1.80
	Dansoman	Nil	60	1.2	0.60
Odaw	Odaw	40	80	15	Not yet known
	Nima	60	90	5.8	3.60
	Onyasia	Nil	70	7.2	4.75
	Mataheko	40	Nil	3.0	2.80
	Mukose	90		4.0	0.40
	Apenkwa	Nil	20	3.0	2.50
Osu klottey	Osu klottey	40	40 on tributaries	5.2	3.20
Kpeshie	Kpeshie	60	20	4.5	4.80
	Kordjor,	Nil	Nil	9.0	8.20
	Napradjor	Nil	60	3.5	4.5
Songo	Songo	40	40	5.5	3.3
	Nii-djor	20	60	3.0	1.2
Mukwoe	Mukwoe	Nil	80	6.8	3.2

251. The original drainage master plan for improving drains within Tema drainage basins was prepared in 1952 by Messrs Doxiadis and Associates during the development of the Tema Township. In 2007, the drainage plan was reviewed to cover the greater part of Tema.

252. The four main drainage channels within the basins in Tema are:

i. Sakumo a total length of 55.169km
ii. Mokwe a total length of 9.067km
iii. East Chemu a total length of 17.720km
iv. Gao a total length of 11.828km

253. While the central and main parts of Tema have a fully developed underground drainage system and sewer network to cater for "grey water" the port-city has grown beyond its planned core, and new developing areas are without stormwater drainage and sullage conveyance network. These communities are therefore prone to perennial flooding. Table 3.14 shows selected drains earmarked for improvement.

Table 3.14: Drainage Basins of Tema and Extent of Improvement

BASIN	DRAIN	% IMPROVEMENT		Total length(km)	Total cost(US$m)
		CONCRETE LINING	Channel Deepening and Widening		
Sakumo	Gbemi	Nil	40	5.8	6.5
	Woezor	Nil	80	2.8	1.9
	Dzorwulu	Nil	20	17.3	9.5
	Onukpawahe	Nil	80	12.0	15.0
	Mamahuma	Nil	30	6.16	7.5
	Water works	30	Nil	4.7	2.65
	Comm 18 area	30	90	5.4	3.8
	Comm12 area	40	Nil	1.93	0.58
	Comm11 area	Nil	Nil	1.50	0.75
	Comm10 (sos) area	30	40	3.05	4.3
	Comm 5 area	20	Nil	1.8	1.5
Mokwe	Mokwe	Nil	40	7.5	7.6
East chemu	Comm 1 drain	40	30	1.2	0.6
	Valco area	60-but needs repairs	Nil	1.0	7.8
	TOR area	60-but needs repairs	Nil	5.6	3.3
Gao	Gao	Nil	Nil	11.1	17.9

254. Kumasi has a drainage development plan that covers phased improvement of the four main basins that drain the metropolitan area. The four main drainage basins are:

- Subin
- Aboabo
- Sissan
- Wiwi

255. The topography (relatively steep slopes from a series of low ridges) of Kumasi provide for good conveyance of storm runoff. With the chanellisation of the Subin, which drains the Central Business District area including Kedjetia Lorry station, Central Market, Asafo Market and Lorry Station, periodic flooding is now limited to flood plains and low lying areas along stream beds with densely populated housing such as Anloga, Aboabo and Ahinsan-Atonsu.

256. The Subin drain has concrete lining of 7.1 km of primary and 5.5 km of secondary drains along its reaches within the built-up sections of Kumasi. The remaining

unlined 40% is on the outskirts of the city beyond Kaasi. About 2.5 km of the Aboabo drain is to be lined under the second-phase of the Urban Environmental Sanitation Project (UESP-II) being financed by GoG and the World Bank.

257. The drainage **master plan for Takoradi** was prepared recently, 2006. The master plan covers the central business district and a greater part of the fast expanding city. There are five main basins within the city: as captured in Table 3.15

i. Whin (Evon hotel, Esikafoe-Amantem No.2, Ashanti Road–Kokompe, Bompe, School Area, Annimens Drain, Chapel hill, Kokompe-Adakope swamp)
ii. Kansawura (Westline/ T-poly drain, Effiekuma Zongo, Kansawura, Wamko OIC)
iii. Pokuantra (Pokuantra, Kojokrom, Bakado)
iv. Anankwari (Nchaban Junction Drain, Esiam /Nchaban)
v. Buiwen (Fijai Junction- Fire Service, Kweikuma drain, Parks and Gardens – Asaman)

Table 3.15: Draingage Basins and Extent of Improvement - Takoradi

BASIN	DRAIN	% IMPROVEMENT	
		CONCRETE LINING	Excavation to open
Whin	Whin	Nil	Nil
	N-valley stream	Nil	Nil
	Mankesim white house	Nil	20
	Airport Road LatterDay Saints,	Nil	80
	PTC/Airport	Nil	30
	Waterworks	30	Nil
	West Tanokrom/Airport	30	90
	GWCL area drain	40	Nil

258. ***Tamale*** has a relatively flat topography and so recession of flood levels is slow with the result that with a mean annual rainfall of 1100mm many areas, in the past experienced severe floods resulting in the loss of lives and property. Tamale has eight drainage basins with a total length of 110km as listed in Table 3.16 below:

259. With the provision of unlined drains along key sections of the drains, housing areas within Tamale no longer experience severe flooding. A 17km stretch covering drains I, E, and F which represent 15% of the prepared drainage master plan have been completely concrete-lined thus providing good drainage of runoff from the central business district.

Table 3.16: Tamale Drains

Name and Location of Drain	**Length (km)**
Drain A (teacher training area drain)	2.143
Drain B (Jnr. Tech school area drain)	2.220
Drain C (Choggo Manayili area drain)	4.762
Drain E (Market area drain)	3.591
Drain F (Tishigu area)	16.260

Name and Location of Drain	Length (km)
Drain H&K	11.705
Drain L,M&N	9.734
Drain I (Jakarayili area drain)	27.667
Total Length	**110.403**

3.4 Environmental Sanitation Education and Enforcement Management

260. Awareness raising through hygiene education and enforcement of regulations for improving sanitation behaviour has been an important aspect of improving and maintaining public health in Ghana. Indeed, the origins of local governments as we find them today, stemmed from the need for effectively promoting and managing public and environmental health. A number of municipal and city councils[15], now referred to as Metropolitan, Municipal and District Assemblies (MMDAs) started as public health boards.

261. As indicated in the section on Legislation and Regulations, ordinances on proper maintenance of public health are among the oldest of the country. For example, the Kumasi Public Health Board Ordinance was passed in 1925. The Board was established to provide salubrious environments of communities and towns and ensure the maintenance of same by the population. Enforcement of bye-laws was effectively achieved by ensuring strict compliance in homes.

262. From the late 1970's, rapid population growth and spread of urban towns as well as the decline in government's ability to provide the necessary logistics that sustained source prevention of diseases (e.g. insecticide spraying to eliminate disease vectors and vermin), and vigorous premises inspections and enforcement by environmental health officers gradually led to the breakdown of enforcement management.

263. The above situation explains, to a great extent, why less than 30% (See Table 3.7) of the population have access to improved sanitation facilities at household level. The problem will remain as the lack of household-level facilities affects mainly low-income communities where majority of people, especially in urban and small towns live, and the population growth is also high.

264. The continued presence of pan-latrines in houses (4% nationally), which was banned in 1999, especially in government premises such as those belonging to the Police Service and MoH, further illustrates the inability of the enforcement and sanctioning system to be applied effectively.

3.4.1 Environmental Sanitation and Hygiene Promotion

265. From late 1980's and early 1990's, lessons of the International Water Supply and Sanitation Decade (IWSSD, 1981 – 1990) showed the importance of households in making decisions not only on choice of technology options and how facilities are installed but also how they are used and maintained correctly. Access to improved water and sanitation implied more than simple coverage numbers but also frequency

[15] The Municipal Ordinance of 1859 established municipalities in the coastal towns of the Gold Coast, in 1943 a new Ordinance set up elected town councils for Accra, Kumasi, Sekondi-Takoradi and Cape Coast.

of un-impeded and sustained usage. The software aspects of environmental sanitation services have therefore received greater attention.

266. The key players in environmental health and hygiene education in Ghana are the MoH, the School Health Education Programme (SHEP) under Ghana Education Service (GES) of the Ministry of Education (MoE), the MLGRD, CWSA (facilitates the promotion of hygiene in communities) and the universities like KNUST, UCC, UDS, UG, UEW Mampong who provide training for hygiene education delivery for the sector.

267. The MoH through the Health Education Unit of the Ghana Health Service (GHS) has traditionally been at the forefront of health education. The unit designs and produces various visual and audio-visual support materials to complement health education activities of the GHS. The unit has a national office and regional offices across the country. The unit over the years has however provided support mainly to campaigns with national character.

268. Community Health Nurses on the other hand deliver a more proactive form of health education as part of their everyday work carrying regular health education activities be it at the health facilities or during outreach activities.

269. The Environmental Health and Sanitation Directorate of the Ministry of Local Government and Rural Development, provides oversight of all environmental health workers in the country, with 10 Regional Health and Sanitation Units providing direct facilitation and supervision of staff within the MMDAs. At the MMDA level, the Environmental Sanitation Policy (Revised 2010) has defined the Environmental Health and Management Department (EHMD) as responsible for environmental health education and related enforcement functions. LI1961 has subsumed these functions under the Department of Health (DoH) at the district level.

270. The bulk of the EHMD staff are field workers who are expected to ensure the management and protection of the environment so as to prevent hazards to human health, conserve natural resources and maintain pleasant surroundings. This function has traditionally been executed through the conduct of premises inspections and prosecution of offenders. However, in recent years due to reforming of environmental health education, the health promotion aspects of the department's work have become highlighted to the detriment of the necessary incentives for enforcement.

271. The Ghana Education Service (GES) of the MoE plays a vital role in health and hygiene education. School Sanitation and Hygiene Education (SSHE) promotion is implemented under the national School Health Education Programme (SHEP).

272. The *School Health Education Programme (SHEP)* was instituted in 1992 after the GoG had become a signatory to the Convention on the Rights of the Child in 1992. The programme's focus is to introduce an integrated health education on healthy school environment to complement academic components of formal education. Ensuring the availability of improved water and sanitation facilities and their proper use is also an important aspect of SHEP's mission.

273. The Ministry of Education (MoE) plays the lead role, with technical support from Ministry of Health (MoH) and other relevant ministries, departments and agencies.

274. The key programme areas of SHEP include Sexually Transmitted Infections (STIs), HIV and AIDS prevention education, general safety, water, sanitation and hygiene, foods & nutrition, drug use and provision of school health services.

275. The basic structure for implementing the SHEP programme consists of National Office, 10 Regional Offices, at all districts and School-Based Health Coordinators and

community-level School Health Committees which bring together stakeholders at the school/community level to give direction to the programme's implementation in each school. In order to sustain capacity building of School Health Committees, District Training Teams are established and trained based on a Trainer's Guide for School Health Committees developed by the national SHEP office[16].

276. The promotion of safe storage of water through the introduction of "Veronica buckets" and hand-washing with soap in schools, have been vigorously pursued with successful results.

277. Hygiene issues with clear targets, aimed at behaviour change in children, have been integrated into the syllabus of basic schools. To deepen the capacity of trainee teachers, workshops are organised for Integrated Science and Social/Environmental Studies tutors to promote the integration of hygiene and sanitation in the curriculum of Teacher Training Colleges (TTCs).

278. An assessment and review of existing IEC materials have been carried out and appropriate ones selected for reproduction, while a School Sanitation and Hygiene Education Manual has been developed based on materials employed by CWSA in carrying out hygiene education in schools.

279. SHEP is integrating the results of the 2007 Global School-based Student Health Survey (GSHS) sponsored by WHO to inform future programming to mitigate the main risk factors that teenagers in school are pre-disposed to. The GSHS measures alcohol and other drug use, sexual behaviours that contribute to HIV infection, other Sexually Transmitted Infections (STIs), and unintended pregnancy, hygiene and protective factors among others.

280. The emphasis on IEC as a focus area in the ESP, Revised 2010 and likewise on Environmental Sanitation Education and Enforcement Management as a key component of environmental sanitation is to provide an integrated means of promoting hygiene and sanitation behavior change across all segments of society. Ensuring effective implementation of SSHE and enhancing community participation in programmes as well as the role of the SHEP constitute important strategies of the NESSAP.

281. In the rural water sector, the National Community Water and Sanitation Programme (NCWSP), launched in 1994, emphasises promotion of hygiene behaviour as a basic requirement for all projects. Typically, hygiene promotion is carried out by Environmental Health Assistants (EHAs) with facilitation support offered by Extension Support Staff of the Community Water and Sanitation Agency (CWSA). The aim of hygiene promotion is to ensure safe water collection, storage and use as well as promoting improved household latrines.

282. In implementing health/hygiene education, the various players in the area have employed a variety of ***methods, approaches and learning materials***. The most common method which has been used to disseminate health/hygiene education information by all actors has been the health/hygiene talk. The health/hygiene talk is an interactive lecture approach that allows the speaker to pass on valuable health/hygiene information or messages to a target audience.

283. This method has been the most frequently used mainly because of the ease of its use and secondly because health/hygiene has always been perceived as a specialised area

[16] Since 2005 the SHEP National office have facilitated the training of 600 School Health Committees in selected schools in four regions namely Eastern, Volta, Central and Greater Accra regions, and 33 District Training Teams were established and trained (2007) under the SSHE Component of WSSPSII.

and information on such issues must come from technical people. The health/hygiene talk is also frequently used in the school setting.

284. The use of visual, audio and audio-visual aids is also popular in health/hygiene education to meet the target audience mostly of children and the population living in rural and peri-urban areas who are unable to read. Posters, billboards, car bumper stickers, comic books, pamphlets, have been the most popular visual support materials.

285. The early days of health education were characterised by film shows at the community level, however, the cost of producing these films and the specialist equipment needed to show them affected health educator's ability to use them over the years. It is only recently that the government has begun re-equipping the Information Services Department (ISD) that it seems likely that, the use of films in health/hygiene education on a large scale might re-emerge.

286. ***Participatory Approaches and Social-Marketing Strategies***: participatory methods like Participatory Learning and Action (PLA), Self-esteem, Associative Strength, Resourcefullness, Action-Planning and Responsibility (SARAR) and Participatory Hygiene And Sanitation Transformation (PHAST) and others are applied extensively to facilitate hygiene education especially within the water and sanitation sector. These methods emphasise the use of dialogues with the target group in facilitating the behaviour change process and the adoption of health/hygiene messages.

287. The use of these participatory methods is more popular with extension workers working with NGOs, CBOs and FBOs than with their counterparts working with mainstream government institutions like the Ghana Health Service.

288. Lately social marketing approaches have also been adopted for promoting sanitation so that sanitation options are targeted to effectively trigger demand and ignite uptake by those who need improvements by segmenting target audiences, as is often applied in marketing of popular brands of consumer items.

289. ***Community-Led Total Sanitation*** (CLTS) is emerging as one of the effective demand-responsive strategies that have the potential of *igniting* the involvement of all individuals and households to collectively identify the main routes of transmission of common diseases and impacts of environmental health problems. The identification of the extent of the problems and the challenges that need to be overcome in order to address the issues of poor sanitation, by community members themselves, usually serve as the initial *trigger* for community mobilization and action.

290. Unlike previous supply-driven approaches which have proven ineffective, CLTS is not prescriptive but embraces all the tools and approaches that enable empowerment of communities to be motivated and so take collective action, with the support of local government and other agencies to effectively promote sanitation awareness and behaviour change.

Box 3.1: Basic Ingredients for Effective CLTS

- Community-based appraisal of current sanitation practices, including open-defaecation.
- Recognizing first the "public" good nature of sanitation and its impact as a "private" good and therefore stimulating demand at the collective level
- The need to maintain personal hygiene by all community members for good public health outcomes, and recognizing the main pathways for common diseases related to poor sanitation and hygiene, not water
- Maintaining an open-defaecation-free (ODF) environment, as an essential element that triggers and sustains collective behaviour change
- Avoiding the reliance of project-type subsidy driven installation of even demonstration latrines
- Identifying existing "anchor groups" within communities and building strategies around their main thrust of activities
- Harnessing political motivation through innovative messages that bring focus on the sanitation problem to enhance policies, institutional strengthening and capacity improvement for scaling-up CLTS momentum
- Assembling all the effective and successful participatory approaches for awareness raising and behavioural change
- Providing enabling support for all facilitators of sanitation and hygiene promotion - private artisans, CBOs and environmental health workers

291. There are, however, a number of basic ingredients that serve to sustain community action beyond the "ignition point" (See Box 3.1).

292. In Ghana, pilot activities in CLTS commenced in selected towns in Central region under District-Based Water and Sanitation (DBWS) Component of the Second-phase of the Water and Sanitation Sector Support Programme (WSSPSII), while the Regional Environmental Health Unit – RCC (Northern Region) piloted CLTS in 16 selected communities with the collaboration of other regional agencies with the support of UNICEF-Ghana.

293. ***Hand-washing Initiative***: Ghana's Public-Private Partnership for Hand-washing with Soap is part of a wider global initiative campaign aimed at addressing the problem of diarrhoeal diseases and acute respiratory infections by promoting the practice of handwashing with soap among mothers and caregivers of children under five years and school children of age 6-15 years. The Truly Clean Hands Campaign launched as part of the PPP-HwS has the ultimate goal of *"a future in Ghana where handwashing with soap at critical times - after contact with faeces and before contact with food - is readily accepted and practiced by all."*

3.4.2 Enforcement Management

294. Enforcement management entails the provision of bye-laws to regulate behaviour, an inspection system for checking compliance, sanctioning mechanisms for failure to comply and a system for conflict resolution.

295. In practice, the communal relationships amongst households in rural areas ensure a self-policing mechanism in many cases. Traditional authority is often the arbiter in environmental sanitation and nuisance offences.

296. In many urban areas, the impact of poor environmental sanitation is more acute and affects health gravely. Environmental health officers provide both education and enforcement. The capacity of these officers in many MMDAs is inadequate and has resulted in nostalgic recall of the old "tankass" or "saman saman" era. The MLGRD

has responded by recently deploying "sanitation guards" as part of the Sanitation Module under the National Youth Employment Programme (NYEP) and lately the implementation of the Coastal Development Project (Eco Brigade) by the Ministry of Environment, Science and Technology (MEST).

297. ***The Expanded Sanitary Inspections, Compliance Management and Enforcement (ESICOME)*** programme was initiated in 1999 to revisit the previously effective colonial and post-independence sanitary inspection and enforcement of bye-laws. The new scope seeks to reinforce public health education methods that were adopted from the late 1970's which was failing to improve environmental sanitation behaviour with the necessary sanctions for non-compliance of bye-laws.

298. The ESICOME programme therefore covers *premises inspection*; *environmental hygiene education*, *dissemination of sanitary information*; and *enforcement of sanitary regulations*. The programme is designed for district-based implementation with facilitation by Regional Environmental Health and Sanitation Directorates (REHSDs).

3.5 Management of Health-Care and Special Industrial Wastes

299. Health-Care Waste refers to all the wastes, solid and liquid, generated from Health-Care Facilities (HCFs) for the delivery of health and related services including medical, veterinary and health-research services.

300. The bulk of wastes (about 60% to 75%) generated from HCFs are generally not hazardous and are normally managed as part of municipal solid waste stream, but need to be handled carefully because of the risk of contamination. The remaining 25% to 40% is rather hazardous and requires special handling and management; pathological waste such as tissues and body fluids, pharmaceuticals, sharps (syringes, disposable scalpels, blades, etc.), non sharps (swabs, bandages, disposable medical devices, etc), chemicals (solvents, disinfectants, etc.) and radioactive materials, pose risks to handlers and personnel and those who come into contact with them if not stored, collected, transported and disposed of safely.

301. Special hazardous wastes refer to waste of hazardous nature generated from industry and some specialised commercial operations. In this NESSAP new sources of waste of indeterminate long-term effect is classified as hazardous until declassified by the relevant authority such as the EPA; included in this category are various waste-electrical and electronic equipment (WEEE), electromagnetic cards used for telephony and other identification-transactions such as Automatic-Teller-Machines (ATMs).

Box 3.2: Overview of Environmental Sanitation Legislation in Ghana

Colonial Legislation

- **Towns Ordinance (4th November 1892)**

This ordinance was applicable to the Colony and was made for the better regulation of towns and the promotion of public health. This Ordinance introduced the position of Inspector of Nuisances, which was defined to include the post of Sanitary Inspectors.

- **Beaches Obstruction Ordinance (29th January 1897, amended 1939)**

This Ordinance was applicable to the Colony and was meant to prevent obstruction and remove obstructions in the use of ports, rivers and beaches.

- **Infectious Disease Ordinance (13th April, 1908)**

This Ordinance was enacted to make better provision for the prevention of the spread of infectious diseases and for the settlement of claims for compensation and damages in connection with measures taken to prevent the spread of such diseases

- **Mosquitoes Ordinance (13th May 1911)**

This Ordinance was made for the destruction of mosquitoes and was applicable to such parts of the Gold Coast as the Minister for Health may by order declare.

- **Quarantine Ordinance (2nd March 1915**)

This Ordinance was applicable to the whole Gold Coast and was made to amend the existing law on quarantine.

- **Vaccination Ordinance (1st January 1920)**

This Ordinance provides for vaccination in the Gold Coast. It deals with the power of the Minister for Health in appointing vaccinating officers and the power to order either generally or with reference to a particular area or places or persons or class of persons to be compulsorily vaccinated free of charge.

- **Land Planning and Soil Conservation Ordinance (1953)**

This Ordinance is aimed at the proper planning and use of land in the Gold Coast. Under the Ordinance, the Minister of Agriculture was empowered to declare Planning Areas by order.

Post-Colonial Legislation

- **Coroners Act, 1960 (Act 18)**

The Act deals with the appointment of coroners, powers of the coroner and notification of deaths.

- **Lands (Statutory Way leaves) Act 1963 (Act 186)**

This Act provides for the entry on any land for the purpose of the construction, installation and maintenance of works of public utility, and the creation of rights of way and other similar rights in respect of such works.

- **Oil in Navigable Waters Act 1964 (Act 235)**

This Act incorporated the international Convention for the prevention of pollution of the sea by oil (1954) and made additional provisions for preventing the pollution of the sea and of navigable waters.

- **Registration of Births and Deaths Act 1965 (Act 301)**

This Act has been amended by NLCD 285 of 1968. With regards to sanitation, the relevant portions are those dealing with dead bodies and burial of the dead.

- **Criminal Code, 1960 (Act 29)**

This Act is on noise, public nuisance and dumping of refuse.

- **LI 1614 (Act 480)**

This Act of the National Development System requires that Municipalities and District Assemblies take over the management of wastewater.

- **Food and Drugs Law, 1992 (PNDC 305**)
- **Environmental Assessment Regulation, 1999 (LI 1652)**

302. The hazardous wastes from health-care facilities have physical and chemical characteristics similar to hazardous wastes from industries and they all need specialised handling. Therefore, much attention is given to this category of health-care wastes and is

the reason for treating health-care waste and special industrial wastes as parts of a component of environmental sanitation in this NESSAP.

3.5.1 Major sources of HCW and handling methods

303. Currently, information on the sources of HCW and the level of management practice is inadequate. The waste generated from health-care facilities vary in proportion to the level of complexity and specialised functions performed, the population of in- and out-patients and the number of auxiliary departments within the facility e.g. radiology, laboratory, research, etc. Waste quantities from teaching, regional and district hospitals are therefore high.

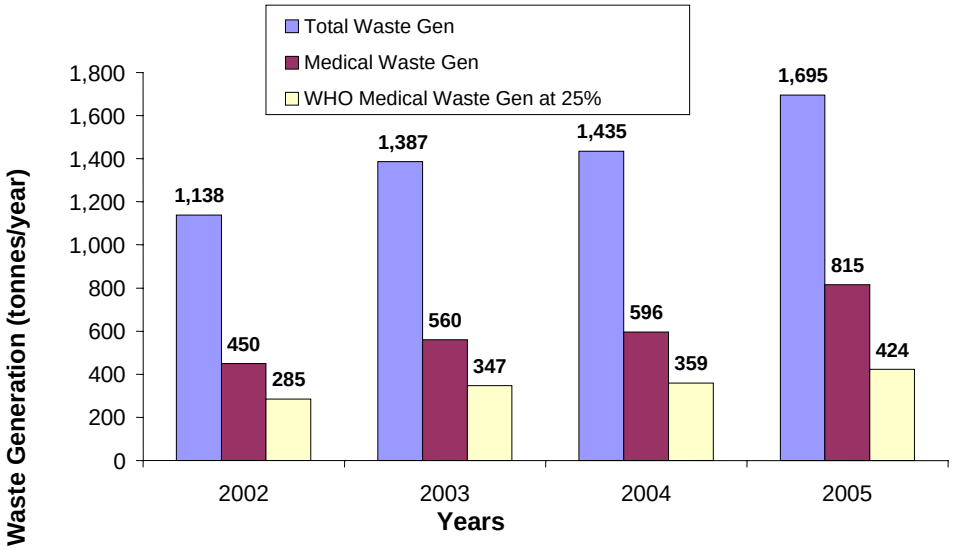
304. According to sector guidelines[17]the generation rate for HCW is estimated at 1.5kg/bed/day. This figure is applicable to large hospitals as it was derived from a survey of major hospitals in Accra[18]. As part of data collection towards preparation of DESSAPs information on waste generation is being collated on health-care waste from health-care facilities.

305. Studies by Wilson et al (2006) on Teaching Hospitals in Accra and Kumasi showed medical waste generated is over 40% of the total healthcare waste which is greater than the expected 10-25% of that of WHO (*See Figure 3.7*). Also

- There are insufficient record on medical waste generated;
- Pathological wastes are incinerated;
- Sharps are collected separately at the generation points but not properly disposed;
- Infectious wastes are very often sent directly to landfill sites without being incinerated;
- Komfo Anokye Teaching Hospital (KATH) mixes medical waste with domestic waste;
- Colour coding for waste segregation and packaging is not effectively practised;
- Vehicles used for medical wastes transportation do not have bio-hazard marks;
- Untreated medical wastes sent to the sanitary landfill sites are mixed with and treated as ordinary municipal waste;
- There is no secondary treatment for secondary wastes;
- There is no specific legislation for the management of medical waste in Ghana.

[17] Guidelines for the Management of Health-Care and Veterinary Wastes in Ghana, EPA/MLGRD 2002.
[18] Report on Hospital Waste Analysis of 6 major hospitals in Accra. Waste Management Department-AMA, 1992.

Figure 3.7: Total Medical waste generated compared with WHO estimate (Wilson et al 2006a)



KBTH Total Waste Generation from 2002 to 2005

306. Health-Care Waste Management (HCWM) in HCFs is generally poor as acceptable standards for storage, collection, transport, treatment and final disposal is not adhered to. Currently, the hazardous portion of solid wastes generated is often mixed with municipal waste and collected by MMDAs or by private companies. The waste is disposed of without segregation or placement in special cells. In many HCFs pathological wastes is disposed of in underground hold tanks and pits. It is only in isolated cases that special treatment such as autoclaving and disinfection occurs prior to disposal.

307. The Ministry of Health (MoH) since 2002 has embarked on a programme of improving handling and final disposal of health-care wastes in the large teaching and regional hospitals. A list of Regional/Specialist HCFs and the planned programmes for improving the management of health-care waste (mainly wastewater and organic fraction of refuse) is presented in Table 5.20.

308. The main category of HCW that poses most danger is pathological waste. MoH is currently installing small-scale incinerators in district-level hospitals where the volume of pathological wastes is small and can be effectively handled in that manner.

309. In Regional and Teaching/Specialist hospitals the volumes of pathological waste is high and treatment via incineration is not adequate as pollution of the immediate environs occurs.

3.5.2 Special Industrial Wastes

310. Industrial waste refers to all categories of wastes produced as a result of industrial activity including factories, mines and mills. A large proportion of it is neither hazardous nor toxic such as wood-waste and shavings from saw-mills.

311. *Special Industrial Wastes* refer to the proportion of wastes from industrial (and sometimes commercial) activities that require special and expert handling and/or special disposal methods because of its quantity, concentration, physical, chemical, and/or biological characteristics. These wastes are often hazardous because they pose substantial or potential threats to public health and/or the environment due to being flammable, oxidising, corrosive, toxic, alkaline, radioactive and/or explosive.

312. They include pesticides, laboratory chemicals, industrial chemicals, spillage and waste-oils, and all related contaminated materials as well as all wastes that require special handling such as out-of-date food waste, empty aerosol cans, electrical and electronic equipment including old refrigerators, spent energy-saving CFC bulbs (contains mercury), CPUs etc.

313. Information gathered from the DESSAP survey data for the major sources and categories of special industrial wastes and commonly used management methods are scantily reported by MMDAs and the regulatory agency EPA.

3.6 Effects on environment and health

314. Environmental sanitation is a major determinant for achieving improved quality of life as it affects quality of the environmental resources on which life depends. All the components of environmental sanitation services taken together have more impact on the health of the environment and people than water.

315. Among the top 10 environment challenges noted in section 2.4, *land degradation due to erosion, pollution of water bodies due to indiscriminate defaecation and refuse disposal, poor waste management, poor air quality* and *unplanned developments leading to frequent flooding* are all due to inadequate environmental sanitation infrastructure and services.

316. At least 6 of the top 10 diseases – *malaria, diarrhoea, diseases of the skin/ulcers, intestinal worm, and acute eye infections* are all related to poor environmental sanitation (See Annex 3). They constitute 70 – 85% of out-patient-department (OPD) cases in health facilities. They are mainly caused through contamination of environmental media (water, air, soil) and food by bacteria, viruses and parasites from poor disposal of refuse and excreta which also promotes breeding of disease vectors.

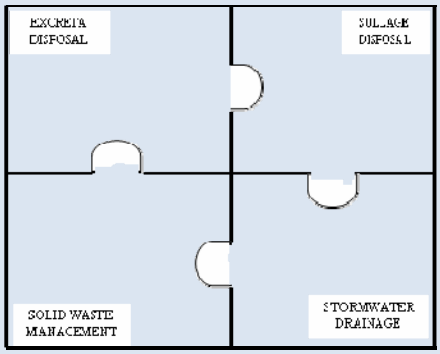
317. While sanitation and hygiene require water, at the present time Ghana is on track to achieving the MDGs for water but wholly off-track regarding sanitation, it is pegged at 13.5% coverage of households for 2009 (DHS, 2008). The NESSAP therefore focuses on improvements in environmental sanitation that will lead to reducing pollution of water sources and breaking the cycle of disease transmission.

318. According to the GPRSII, in terms of economic costs about 5.5% of GDP (GH¢ 475m per annum) is lost annually due to degrading environmental resources. The total expenditure on health is estimated at 4.9% of GDP[19] substantial portion of which is due to poor environmental sanitation-related diseases.

319. The wider effects of poor environmental sanitation require that an integrated approach is adopted if any effective gains are to be achieved with respect to the above issues. (See Box .3.3.)

[19] WHO National Accounts, 2004.

Box 3.3: Integration of Environmental Sanitation Services is Essential:



- Sullage and stormwater are often carried in the same drains.
- Maintenance of drains and sewers will be more difficult where poor solid waste management is poor
- Some excreta disposal methods (for instance pit latrines) will require that separate provision is made for sullage disposal

Source: Strategic Planning for Municipal Sanitation, GHK Research & Training Ltd in Association with WEDC and WSP-SA, July 2000.

3.6.1 Malaria

320. ***Malaria*** remains the leading killer of pregnant women and children under five. There are many methods currently applied in Ghana for malaria control including *mosquito nets and insecticide treated mosquito nets*; *House protection with screening of windows, eaves and doors; Use of repellents, indoor residual spraying; Fumigant insecticide dispensers (such as coils)* and *spraying of insecticides outdoors.*

321. The cost effective and sustainable method directly related to environmental sanitation are those that effectively lead to reduction of vector density and thus impact on vector control on the transmission potential (i.e. reproduction rate, vectorial capacity).

322. Most practical methods aiming at the reduction of vector densities require the treatment of vector breeding places, leading to their elimination or to a considerable reduction of breeding in the treated sites - these methods include all forms of larval control.

323. *Source reduction by environmental management methods* (or malaria sanitation) includes drainage, flushing, filling, and rendering river and lake margins unsuitable for anopheline breeding. These methods have been the classical means of malaria prevention during colonial and the period immediately after independence. In recent times, this method is being revisited, particularly, in Accra metropolis with trials in *La*, *Taifa* and other areas (the so called targeted specific breeding places of local importance). Environmental management methods are the most sustainable means of source prevention of malaria and require a sustainable source of financing for improving and securing maintenance management of facilities for stormwater and sullage conveyance.

324. *Larviciding* including the use of both chemical insecticides such as the toxin of *Bacilus thuringiensis israelensis* and those of biological origin, and insect growth

regulators is also applied selectively. It requires the treatment of all breeding places and because of poor residual effect require regular and frequent applications.

325. Biological control for anophelines, is limited to the use of predators (mainly larvivorous fish), which are most effective in man-made breeding sites (e.g. ponds, or irrigation ditches).

326. The broadening of the scope of hygienic disposal of excreta to include improved wastewater and sullage management as well as all other aspects of environmental sanitation services as proposed by the Environmental Sanitation Policy (Revised, 2009) is essential for effective malaria control. Table A6 of Annex 2 indicates the distribution of reported cases of malaria by region across the country.

3.6.2 HIV/AIDS

327. ***HIV/AIDS*** continues to be a menace though there are encouraging reports of its decline in recent times. It is reported that in 2004, approximately 400,000 Ghanaians were estimated to be HIV-positive and this number is expected to reach 500,000 by 2015. The prevalence rates have increased from 2.6 percent in 2000, to 3.6 percent in 2003, and 3.1 percent in 2004.[20] The prevalent rate is reported to be 2.2% by the end of 2007.

328. The National Strategic Framework 2006–2010 (NSF II) prepared by the National Aids Commission recognises the HIV/AIDS epidemic as a socio developmental challenge and, therefore, incorporates issues dealing with recent evolutions in the epidemic, the social forces driving the epidemic, the socio-cultural environment, and the experiences from the first strategic framework 2001–2005 (NSF I). The framework provides an overall planning guide for dealing with improvements in programme supporting structures, preventing infections, targeted behaviour change programmes to the general population as well as specific vulnerable groups, treatment, care and support, and combating stigma and discrimination.

329. MMDAs and their collaborators have been working within the above general framework to achieve a number of objectives including:- to scale up targeted Behavioural Change Communication (BCC) and Information, Communication and Education (IEC) programmes; to increase knowledge levels and also raise awareness about the pandemic; to scale up social mobilization for HIV/AIDS prevention especially at the community levels; to enact and enforce policies and laws that protect the rights of People Living With HIV/AIDS (PLWHA), Orphans and Vulnerable Children (OVC) within the workplace and vulnerable groups; to engage civil society in community preparedness through relevant IE&C and BCC activities for the rollout of Anti-retroviral Testing (ART) and Voluntary Counseling and Testing (VCT).

330. For environmental sanitation services the important considerations include how the policy (and therefore the NESSAP) takes on board the key elements of the strategies being implemented by MMDAs and, in particular, ensure that service levels and standards are responsive to the needs of PLWHA. It has been established that the needs of PLWHA for sanitation and hygiene are more acute – for example, there is need for more water for drinking and for frequent bathing to reduce heat-flushes, and for medication.

331. The stigmatization that goes with HIV/AIDS is also very critical. It has been reported that in the traditional compound-house setting of low-income areas (where the bulk of people live) where shared and communal facilities are the available options, PLWHA

[20] National AIDS/STI Control Programme, GHS, 2005

are often either banned from use of household toilets or other householders avoid using such facilities immediately after use by PLWHA or where they have access to such facilities other householders go to great lengths to clean toilets or bathrooms with disinfectants before use.

332. Incorporating relevant strategies and activities, by MMDAs to meet the objectives of the NSFII is an important consideration of the NESSAP.

3.6.3 Climate Change and Global Warming

333. That the earth's climate is changing with serious effects is without doubt. The uncontrollable variability of this change and its impact requires that Ghana puts in place adaptation mechanisms. While ***Global Warming*** is now receiving high-level political attention globally due to its impact there remains more to be done at the country level.

334. Proposals for limiting global warming include reducing primarily Carbon dioxide (CO_2) and non-CO_2 emissions of methane and black-carbon aerosols, which make up the bulk of greenhouse gases (GHGs).

335. Municipal Solid Waste Management (MSWM) has a direct impact on emission of GHGs, although proportionately it is low (in the range of 2 – 3% of GHGs globally[21]. Landfill gas (LFG) consists mainly of methane (CH_4), carbon monoxide (CO) and hydrogen sulphide (H_2S). Furthermore, there are more than 2000 trace elements in this kind of biogas.

336. Through the efficient collection of landfill gas it is possible to reduce the emission of methane and carbon dioxide to the atmosphere and to avoid pollution and unpleasant odours as well as dangerous gas explosions. For example, improving landfill cover by exploiting natural processes of microbial methane oxidation is an inexpensive way of reducing methane emissions from landfills. This process can be enhanced by using compost as landfill cover which further improves the conditions for methanotrophic bacteria to thrive.

337. The *Clean Development Mechanism (CDM)* was developed to commit developed economies in achieving targets set under the Kyoto Protocol[22] more effectively. The CDM, defined in Article 12 of the Protocol, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in developing countries. Such projects can earn saleable *certified emission reduction* (CER) credits, each *equivalent to one tonne of* CO_2, which can be counted towards meeting Kyoto targets.

338. Simply, a CDM[23] project involves an industrialised country paying for projects that reduce or avoid emissions in poorer nations and therefore earn (or buy back) credits that can be applied to meeting their own (industrialised country) emission targets.

339. A typical CDM project potentially reduces net GHG emissions into the atmosphere through collection and combustion of LFG (methane) by financing an engineered landfill and upgrading current waste management practices. A variation for reducing greenhouse gases is to use the collected methane gas for a waste-to-energy (WtE) plant which substitutes combustion of fossil fuel for energy production. The net

[21] Sardinia 2007, Executive Summaries, R. Cossu et al. Environmental Sanitary Engineering Centre (CISA), 2007.
[22] The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005.
[23] The EPA as the the Designated National Authority (DNA) on CDM has prepared a working document "The Clean Development Mechanism in Ghana" to guide implementation of potential projects.

emission reduction achieved by energy utilization is however limited compared to flaring of methane only.

340. Information about past waste management practices is necessary for the estimation of methane emissions from refuse dumps because the emissions of today are the result of waste disposal years or decades ago. So without proper historical records on volumes and composition of waste streams it is difficult to estimate the environmental effects from management of municipal waste. Currently, there are only two-engineered landfills in Ghana and over 15,000 uncontrolled open dump sites with accompanied open burning.

341. The MTDPF (2010-2013) and the Environmental Sanitation Policy (Revised, 2009) emphasise improvements in disposal sites and R&D that will lead to more information on all waste streams.

342. Climate change has the effect of making weather patterns unpredictable. In extreme cases the impacts are either severe flooding which causes all types of wastes handling and treatment systems ineffective or drought affecting sources of water for basic drinking and for maintaining basic sanitation.

3.7 Gender, Poverty and Governance Sensitiveness

343. The social consequences of existing poor and inadequate environmental sanitation facilities and services have constraints on gender equity, poverty and good governance and civic responsibility which are key themes in MTDPF (2010 -2013).

Box 3.4: Balancing Gender, Wealth and Location for Improving Sanitation

- The MDG for sanitation needs to be supplemented with explicit targets for reducing inequalities based on wealth, gender and location.
- Increasing the voice of women in public policy debates, and in markets for sanitation technology, would strengthen household demand and incentives for better service supply. Women tend to demand sanitation more than men, but make fewer household spending decisions.
- The sanitation taboo has been difficult to break partly because the deficit is borne overwhelmingly by the poor.

Source: Human Development Report 2006, UNDP

344. According to the UNDP 2006 HDR, progress on human development depends on solving the vast deficit in sanitation and a lot of it is dependent on how well *gender*, *poverty* and *location* issues are balanced.

345. ***Gender*** – women and children are the most adversely affected by poor and inadequate environmental sanitation services/facilities – loss of dignity, girls' school drop out, maternal and child health issues, and responsibility for basic domestic chores.

346. ***Poverty*** - is deepened further by poor/inadequate environmental sanitation services and facilities resulting in poor health, loss of labour and productivity, increased cost of health care, and decreased productivity from degraded and polluted natural resources such as land and water.

347. ***Governance*** – health, dignity and participation in decision-making and –taking are basic rights that are curtailed by poor environmental sanitation mainly due to disease burden and ill health. In many instances morbidity may lead to social exclusion from such activities like voting, community meetings and other participatory fora. Indeed

it is reported that malaria (which ranks first among the top ten OPD cases) directly disenfranchises about 6-8% of Ghanaians on any given national-level voting event.

348. On the other hand civic responsibility as a function of good governance requires attitudinal change and better compliance by citizens with laid down regulations and byelaws which are intended to reduce nuisance and improve environmental sanitation.

349. The issue of how sanitation impacts governance and its implications for all the MDGs justifies why improving sanitation should be given a rights-based consideration.

3.8 Financing of Environmental Sanitation Infrastructure and Services

350. Improving environmental sanitation infrastructure and services requires the mobilization of more financial resources for both capital investment and O & M. This section of the NESSAP gives an overview of the procedures that govern financial administration at MMDAs and the current state of the various revenues generated by MMDAs and the transfers they receive from central government, and development partners.

351. Indications are that environmental sanitation is receiving more attention over the past few years due to events such as the focus of the UNDP Human Development Report, 2006 on water and sanitation, the momentum generated by the UN declaration of 2008 as the International Year of Sanitation (IYS), and the advocacy gains of strategies such as CLTS.

352. The recently developed Sanitation and Water for ALL: a Global Framework of Action (SWA) is a source of further support to those countries, including Ghana, that are currently "off-track" in terms of meeting the MDG Target 7c.

353. The increased attention makes it important that fiscal management at MMDAs is examined critically in order to identify and recommend potential sources of financing for achieving the incremental improvements in environmental sanitation infrastructure and related operation and maintenance management of services.

3.8.1 Legal framework on Local Government Finance

354. The legal framework that guides MMDAs in their financial management of resources includes the following.

- The District Assemblies Common Fund Act, 1993(Act 455) with updated guidelines
- Ghana Audit Act, 2000(Act 584)
- Local Government Service Act,2003 (Act 656)
- Public Procurement Act, 2003 (Act 663)
- Internal Audit Agency Act, 2003 (Act 658)
- Financial Administration Act, 2003 (Act 654)
- Financial Administration Regulation, 2004 (LI 1802)
- Financial Memoranda for Metropolitan, Municipal and District Assembly of 1961, revised in June 2004,
- Internal Revenue Act, 2005(Regulation of Business, Act 684)
- Composite Budget Guidelines (under review by MLGRD)
- Guideline for preparation of budgets
- Guidelines for preparation of District Medium Term Development Plan, January 2006 (by NDPC)

355. The above legislations give further direction to MMDAs in exercising their mandates as provided in the Local Government Act, 1993 (Act 462) and the National Development Planning System Act, 1994 (Act 480).

356. The Financial Administration Act, 2003(Act 654) and Financial Administration Regulation, 2004 (LI 1802) provide the framework for the Financial Accountability System for Ministries, Departments and Agencies as well as MMDAs. Act 654 mandates the Ministry of Finance and Economic Planning (MoFEP) in the preparation of the fiscal policy of government for presentation to parliament for ratification.

357. The Controller and Accountant General's Department (CAGD) by law (Financial Administration Act, 2003 (Act 654)) is the primary disbursement agency of the government.

358. The Financial Memoranda (2004) for MMDAs defines and complements both the Financial Administration Regulation LI 1802 and the Local Government Act 642 and defines control systems with respect to revenue and expenditure.

3.8.2 Public Finance and Share to Local Government[24]

From the 2009 budget statements and economic policy of Ghana, the nominal size of GDP `has grown from G¢7.9 billion in 2004 to G¢17.6 in 2008 and the public expenditure has increased even faster, see table below. Table 3.17 provides further information.

Table 3.17: Public Expenditure and Revenue Trends

	2004	2005	2006	2007	2008
GDP (Nominal size) Gh¢(billion)	7.99	9.72	11.6	14.0	17.6
Population (million)	21.7	22.1	21.9	22.3	22.9
Per Capita GDP- Gh¢	368.13	439.82	523.32	614.68	753.49
Tax Revenue % GDP	21.7%	22.1%	20.2%	23.7%	24.9%
Total Public Expenditure *(billion)- Gh¢	2.19	2.51	4.33	4.25	9.54
Total Public Revenue *(billion)	Gh¢2.37	Gh¢3.03	4.33	4.25	9.54
Annual Average Inflation	12.6%	15.4%	11.7%	10.7%	16.5%

Source: * 1. from 2004 and 2005 audited public accounts of Ghana and 2007 Budget Statement and Economic Policy of Ghana, MoFEP.
2. 2006-2008 Statistical Service, 2008 and 2009 Budget Statement.

359. The expenditures and revenue of MMDAs accounts for a small part of total public expenditures (See Table 3.18 and 3.19). This share has been stable for the past10 years, whereas the MMDAs' share of the GDP has declined significantly from 2.6% in 1996 to 1.7% in 2007.

[24] The information in this section is mainly from secondary sources including Joint GoG/DP Decentralisation Policy Review, Final Report DEGE Consult and NCG, February 2007; Personal communication with staff of MLGRD, DACF and MoFEP. Source: 2004 and 2005 Audited Public Accounts of Ghana. 1996 Data: Appiah, Baah Wiredu, Steffensen et al: Fiscal Decentralisation and Sub-National Government Finance in Relation to Infrastructure and Service Provision in Ghana, 2000, Final Report, Annexes.

Table 3.18: MMDAs Share of the Total Public Expenditure

Expenditure	2004	2005	2006	2007	2008
Total public expenditure (billion)	GH¢2.19	GH¢2.51	Gh¢4.33	Gh¢4.25	9.54
Total MMDA expenditure (billion)	GH¢0.14	GH¢0.15	Gh¢0.18	Gh¢0.24	
MMDA Expenditure of Total Public Expen.	6.4%	6.0%	4.2%	5.6%	
MMDA Expend. of GDP	1.8%	1.6%	1.5%	1.7%	

Source: 2004 and 2005- Audited Public Accounts of Ghana. 2006- 2009 Budget statements
2008 MMDA expenditures not yet available

Table 3.19: MMDAs Share of the Total Public Revenue

Revenue	1996	2004	2005	2006	2007	2008
Total Public Revenue (billion)	¢2,097	Gh¢2.37	Gh¢3.03	Gh¢4.33	Gh¢4.25	Gh¢9.54
Total MMDA Revenue (billion)	¢110	Gh¢0.14	Gh¢0.16	Gh¢0.19	Gh¢0.23	Gh¢
MMDA revenue of Total public Revenue	5.3%	6.0%	5.3%	4.4%	5.4%	
MMDA Revenue of GDP	2.5%	1.8%	1.6%	1.6%	1.6%	

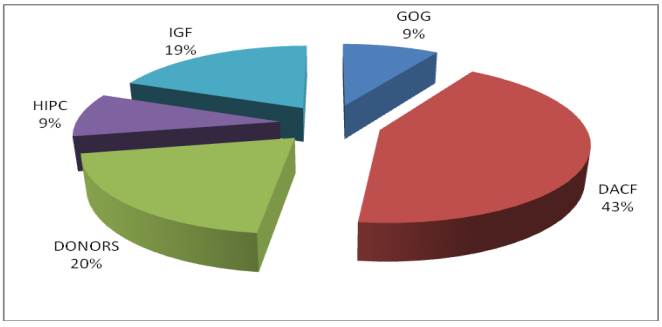
Source: from the 2004/2005 Audited public accounts of Ghana and data from MLGRD; 2006-2008 -Budget Statement 2007- 2009; 2008 MMDA Revenue not yet available
1996: Data: Appiah, Baah Wiredu, Steffensn et all. "Fiscal Decentralisation and sub-National Government Finance in Relation to Infrastructure and Service Provision in Ghana", March 2000, Final report Annexes.

3.8.3 Sources of Revenues and Expenditure Categories

360. *MMDAs* derive *revenue* from many sources. Local Government finance provisions are defined in Article 245 of the 1992 constitution and Section 34, Part VII and VIII of Act 462. The MMDAs in Ghana are financed from three main sources: (i) Internally Generated Fund (IGFs); (ii) transfer from central Government; and (iii) donor support. There has been a significant increase in resources available for MMDAs over the past 5-10 years, however mostly in the form of increase in the funds from the DACF (District Assemblies' Common Fund).

361. In 2008, the DACF constituted 43% of the overall resources to the MMDAs, followed by donor inflow and IGF 20% and 19% respectively. The central government and HIPC transfers to the MMDAs represented 9% each (Figure 3.8).

Figure 3.8: Main sources of revenue/allocations to MMDAs, 2008.



Source: Annual Progress Report GPRSII, 20009 (DACF Secretariat, 2008)

362. ***Ceded Revenues***, which were supposed to be revenues collected by the Internal Revenue Service on behalf of MMDAs and then subsequently shared with the MMDAs. This has not been adhered to in recent years and has always been irregular revenue sources for the MMDAs.

363. The Ceded Revenues were made up of entertainments, casino, betting, gambling, business profession/trade registration, transport and advert taxes, collected by the IRS and transferred to the MLGRD for sharing to all MMDAs according to a formula approved by Cabinet (the sharing of Ceded revenue has with few exemptions in practice ceased to with the inception of the DACF in 1994) and formally with the Act No. 684.

364. ***Internally Generated Funds*** are the traditional own-source revenues collected by MMDAs. These revenue items are listed under the Sixth Schedule of Section 86 of the LG Act, 1993 (Act 462) and include: Basic Rates, Special Rates, Property Rates, Fees, Licenses, Trading services; Royalties; Mineral Development Fund and Investments Income and other sources.

365. The Local Government Act, 1993, (Act 462) empowers MMDAs to generate revenue from levies, fees and licenses for specified activities. The law further provides that such revenue shall be taxed or collected exclusively by DAs, although they may authorize another government body to collect revenue on their behalf. A number of taxes (including land and court fines) are collected by the central government on behalf of all MMDAs. Royalties from the exploration of resources such as timber or minerals are collected by the relevant central government agency, and a proportion of the royalty is remitted to the relevant MMDA within whose jurisdiction the specific activity takes place.

366. ***Property Rates*** levied on owners of landed properties based on their value, present potentially the most lucrative sources of IGFs for MMDAs, particularly those with large urban townships. The Land Valuation Board (LVB), established in 1986, took over the property tax valuation work of the former Land Valuation Division of the then Ministry of Local Government. Under the IDA-assisted Accra District Rehabilitation Project (ADRP) and with the assistance of the United Kingdom Valuation Office (UKVO), LVB carried out a revaluation exercise in Accra which was completed in 1988. As a result, Accra achieved a 70 percent increase in property tax revenues in real terms between 1988 and 1990.

367. Following the successful completion of property revaluation in Accra, LVB undertook a similar exercise in Tema and extended it to Kumasi, and Sekondi-Takoradi under the IDA-financed Urban II Project.

368. In nominal terms, all the five Metropolitan Assemblies (Accra, Kumasi, Sekondi-Takoradi[25], Tamale, and Tema) have steadily increased IGFs over the 1988-2006 period (See Table 3.21).

369. Presently the IGFs do not cover the recurrent cost of MMDAs. Table 3.20 shows the total IGFs and the main sources of revenue for 2004 and 2005.

[25] Since February 2008, Shama-Ahanta Metropolitan Assembly has been split into two – Sekondi-Takoradi Metropolitan Assembly and Ahanta East Municipal Assembly.

Table 3.20: Total MMDA Revenues and Expenditure, 2004-2007 (GH¢)

	2004		2005		2006		2007	
	Amount	%	Amount	%	Amount	%	Amount	%
Rates	5,441,992	4	6,761,648		6,860,764	4	7,246,684	3
Land	3,396,189	2	2,757,309		4,001,192	2	5,625,244	2
Fees and Fines	6,799,884	5	10,064,760		10,594,078	6	13,651,579	6
Licences	3,178,664	2	5,450,449		5,981,455	3	8,211,554	4
Rent	1,133,260	1	1,530,855		1,867,314	1	1,990,592	1
Investment	739,777	0.5	1,081,074		699,694	0.4	607,478	0.4
Misellaneous	2,000,326	1	1,656,325		1,979,948	1	3,372,186	1
TOTAL IGF	**22,690,092**	**16**	**29,302,420**		**31,984,445**	17	**40,705,317**	18
Salaries Transfer	11,546,748	8						6
DACF	61,909,857	44			89,344,337	47	77,481,257	33
HIPC Funds	32,183,739	23			29,665,755	16	27,862,352	12
Donor Support	13,865,941	10						
Total External Revenues	**119,506,285**	84			**159,163,718**	83	**191,816,802**	82
Total Revenue	**142,196,378**	100			**191,148,163**	100	**232,522,119**	100
Expenditures								
Personnel Emoluments	16,402,934	12			23,367,933	12	31,337,235	13
Travelling and Transport	4,727,816	3			6,493,479	3	8,476,914	4
General Expenses	3,443,667	2			4,436,028	2	6,327,069	3
Repairs and Maintenance	831,197	1			1,394,664	1	2,298,481	1
Miscellaneous	5,994,142	4			9,578,225	5	15,948,428	7
Total Recurrent Expenditures	31,399,756	22			45,270,329	24	64,388,127	28
Capital Expenditures	111,683,505	79			132,713,208.	69	175,119,958	75
Total Expenditure	**143,083,261**	101			**177,983,537**	**93**	**239,508,085**	103
Excess of Revenue over Expenditure	**(886,883)**	**-1**			**13,164,626**	**7**	**(6,985,966)**	**-3**

Source: World Bank tabulation of data from MAs; (1998-1992), CAGD-Local Government Accounts (2004, 2006).

370. ***User Fees and Charges*** constitute an important source of IGFs from a multitude of licensing fees and similar levies on businesses and self-employed persons in MMDAs. However, MMDAs have rarely any systems in place for effective collection of user fees and charges. The main problem is that there are too many different types of levies, making them difficult and unproductive to collect. In addition, the fees are often levied as flat rates (regardless of the volume of business) and are comparatively very low. Local business taxes, for example, offer enormous future potential as a major revenue source for MMDAs.

371. These fees in aggregate represented 31 percent of all own source revenues of the five Metropolitan Assemblies. Market fees, for example, are important sources of IGFs in Kumasi, Shama-Ahanta, and Tamale. Kumasi consistently obtained around 45 percent of all its IGFs from market fees over the period 2000 to 2007.

Table 3.21: Revenues and Expenditures of 5 Metropolitan Assemblies 2004-2007

Yr		Accra		Tema		Kumasi		Shama-Ahanta East		Tamale		TOTAL	
2004	REVENUES	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**
	Rates	1,194,604	24	1,088,924	45	503,591	28	279,465	40	55,132	42	3,121,716	31
	Land	38,010	1	-	0	149,384	8	68,972	10	8,543	6	264,909	3
	Fees and Fines	1,833,912	37	725,693	30	623,127	35	103,236	15	31,151	23	3,317,119	33
	Licenses	939,082	19	450,901	19	344,645	19	168,987	24	25,323	19	1,928,938	19
	Rent	318,454	6	5,999	0.2	95,866	5	69,699	10	11,493	9	501,511	5
	Investment	3,228	0.1	39,580	2	23,628	1	229	0.03	500	0.4	67,165	1
	Miscellaneous	666,098	13	106,098	4	37,290	2	15,171	2	516	0.4	825,173	8
	TOTAL IGF	4,993,388	100	2,417,382	100	1,777,531	100	705,758	100	132,659	100	10,026,531	100
	EXPENDITURES												
	Personnel Emoluments	2,598,558	52	1,113,724	46	1,071,621	60	550,716	78	258,970	195	5,593,589	56
	Travelling and Transport	570,183	11	387,362	16	459,827	26	234,576	33	61,182	46	1,713,130	17
	General Expenses	491,055	10	286,923	12	282,570	16	115,900	16	38,244	29	1,214,692	12
	Repairs and Maintenance	146,634	3	68,726	3	114,484	6	22,474	3	3,685	3	356,003	4
	Miscellaneous	2,586,421	52	192,892	8	339,427	19	196,534	28	29,484	22	3,344,758	33
	Total Recurrent Expenditure	6,392,851	128	2,049,627	85	2,257,929	127	1,120,202	159	391,566	295	12,212,175	122
	Excess of revenue over expenditures	-1,399,463	-28	367,568	15	-480398	-27	-414,443	-59	258,908	-195	-2185,644	-22

Yr		Accra		Tema		Kumasi		Shama-Ahanta East		Tamale		TOTAL	
2005	REVENUES	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**
	Rates	3,051,591	**25%**	**834,887**	**35%**	**439,652**	**25%**	**350,958**	**38%**	**34,477**	**21%**	**4,711,565**	**27%**
	Land	126,690	1%	0	0%	146,280	8%	78,430	8%	6,829	4%	358,229	2%
	Fees and Fines	4,567,002	38%	836,788	35%	617,406	35%	193,954	21%	39,207	24%	6,254,357	36%
	Licenses	2,837,464	24%	648,602	27%	366,758	21%	203,592	22%	30,426	18%	4,086,842	24%
	Rent	833,666	7%	35,768	2%	89,208	5%	63,174	7%	31,996	19%	1,053,812	6%
	Investment	278,552	2%	0	0%	13,680	1%	288	0%	193	0%	292,713	2%
	Miscellaneous	369,167	3%	19,981	1%	76,963	4%	43,589	5%	23,649	14%	533,349	3%
	TOTAL IGF	12,064,132	100	2,376,026	100	1,749,948	100	933,924	100	166,778	100	17,290,808	100
	EXPENDITURES												
	Personnel Emoluments	7,211,680	60%	1,371,039	58%	1,310,090	75%	640,511	69%	320,984	192%	10,854,304	63%
	Travelling and Transport	1,476,753	12%	407,751	17%	478,948	27%	256,193	27%	65,692	39%	2,685,337	16%
	General Expenses	1,393,529	12%	253,158	11%	153,931	9%	96,188	10%	33,235	20%	1,930,041	11%
	Repairs and Maintenance	1,062,805	9%	82,867	3%	105,742	6%	44,909	5%	2,684	2%	1,299,007	8%
	Miscellaneous	9,222,893	76%	178,550	8%	480,220	27%	37,533	4%	29,028	17%	9,948,224	58%
	Total expenditure	20,367,660	169%	2,293,365	97%	2,528,931	145%	1,075,334	115%	451,623	271%	26,716,913	155%
	Excess of income over expenditures	-8,303,528	-69%	82,661	3%	-778,983	-45%	-141,410	-15%	-284,845	-171%	-9,426,105	-55%

Yr		Accra		Tema		Kumasi		Shama Ahanta East		Tamale		TOTAL	
2006	REVENUES	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**
	Rates	1,535,100	21%	1,350,570	37%	443,675	22%	396,143	37%	20,751	12%	3,746,239	26%
	Land	15,159	0.2%	0	0%	213,961	11%	110,977	10%	8,348	5%	348,445	2%
	Fees and Fines	2,545,380	34%	1,351,348	37%	730,903	36%	245,300	23%	58,819	33%	4,931,750	34%
	Licenses	2,113,692	28%	900,171	24%	454,599	22%	230,941	21%	58,819	33%	3,758,222	26%
	Rent	1,011,603	14%	4,646	0.1%	135,136	7%	79,427	7%	27,318	15%	1,258,130	9%
	Investment	3,044	0.04%	5,746	0.2%	14,111	1%	11	0%	278	0.2%	23,190	0.16%
	Miscellaneous	210,844	3%	72,491	2%	28,895	1%	21,483	2%	2,404	1%	336,117	2%
	TOTAL IGF	7,434,822	100%	3,684,972	100%	2,021,280	100%	1,084,282	100%	176,737	100%	14,402,093	100%
	EXPENDITURES												
	Personnel Emoluments	3,815,265	51%	1,926,347	52%	1,491,740	74%	897,982	83%	286,300	162%	8,417,634	58%
	Travelling and Transport	810,524	11%	652,024	18%	517,000	26%	384,416	35%	45,815	26%	2,409,779	17%
	General Expenses	899,692	12%	372,349	10%	407,850	20%	115,872	11%	51,920	29%	1,847,683	13%
	Repairs and Maintenance	550,846	7%	187,589	5%	44,068	2%	66,722	6%	7,035	4%	856,260	6%
	Miscellaneous	4,999,295	67%	270,090	7%	470,407	23%	199,765	18%	35,343	20%	5,974,900	41%
	Total Expenditures	11,075,622	149%	3,408,399	92%	2,931,065	145%	1,664,757	154%	426,413	241%	19,506,256	135%
	Excess of income over expenditures	-3,640,800	-49%	276,573	8%	-909,785	-45%	-580,475	-54%	-249,676	-141%	-5,104,163	-35%

Yr		Accra		Tema		Kumasi		Shama Ahanta East		Tamale		TOTAL	
2007	REVENUES	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**	**Amount**	**%**
	Rates	1,174,484	13%	965,195	26%	584,975	16%	139,113	36%	36,341	15%	2,900,108	17%
	Land	22,884	0.3%	12,607	0.3%	221,216	6%	15,015	4%	24,792	10%	296,514	2%
	Fees and Fines	3,128,134	34%	1,440,539	39%	2,018,747	54%	96,415	25%	68,544	28%	6,752,379	39%
	Licenses	3,402,989	38%	1,191,037	32%	655,514	18%	74,850	19%	66,865	27%	5,391,255	31%
	Rent	1,097,142	12%	7,019	0.2%	191,753	5%	27,081	7%	44,907	18%	1,367,902	8%
	Investment	12,084	0.1%	2,965	0.1%	8,414	0.2%	0	0%	735	0.3%	24,198	0.1%
	Miscellaneous	234,529	3%	113,675	3%	41,236	1%	31,672	8%	3,721	2%	424,833	2%
	TOTAL IGF	9,072,246	100%	3,733,037	100%	3,721,855	100%	384,146	100%	245,905	100%	17,157,189	100%
	EXPENDITURES												
	Personnel Emoluments	3,516,723	39%	2,269,642	61%	2,621,744	70%	0	0%	211,700	86%	8,619,809	50%
	Travelling and Transport	1,169,609	13%	851,029	23%	610,530	16%	0	0%	53,084	22%	2,684,252	16%
	General Expenses	1,600,655	18%	368,595	10%	406,605	11%	0	0%	36,071	15%	2,411,926	14%
	Repairs and Maintenance	882,749	10%	299,329	8%	242,096	7%	0	0%	3,002	1%		0%
	Miscellaneous	8,715,164	96%	311,628	8%	850,196	23%	0	0%	71,553	29%	9,948,541	58%
	Total Recurrent Expenditure	15,884,910	175%	4,100,226	110%	4,731,171	127%		0%	375,412	153%	25,091,719	146%
	Excess of income over expenditure	-6,812,664	-75%	-367,189	-10%	-1,009,316	-27%	384,146	100%	-129,507	-53%	-7,934,530	-46%

Source: Inspectorate Department (Local Governments Accounts), MLGRD, 2009

372. Although the IGFs of each of the five major cities have increased annually since 2004 as the tables above reveal, they are still not adequate to cover all the annual recurrent

expenditures and they either have to defer settlement of debts, postpone rendering services or rely on grants from the Central Government and other donor sources.

373. ***MMDA borrowing*** has traditionally been very low. Section 88 of the Local Government, 1993 (Act 462), states that MMDAs can obtain loans or overdrafts within Ghana with approval of MLGRD in consultation with the MoFEP. MMDAs can borrow without approval up to a ceiling of GH¢2,000. This ceiling has not been up-dated since 1993 and is very inadequate given the usual MMDA investment needs. In reality many MMDAs owe service providers and suppliers over and above this threshold and constitute "indirect borrowing".

374. ***MMDAs recurrent expenditure*** fall under the following categories: (a) salaries and wages; (b) transport and traveling costs; (c) maintenance and repairs; and (d) overhead and operating expenses.

3.8.4 Inter-governmental Transfers to MMDAs

375. The main objectives of central government transfers to MMDAs include: (a) funding development programs of national significance; (b) encouraging DAs to develop programs in line with national policy and ensuring compliance with national policies and standards; (c) stimulating growth in local economies; (d) securing an equitable standard of services; and (e) compensating MMDAs with a narrow internal revenue base. Transfers include both block and targeted grants.

376. Transfers of Grants-in-aid from Central Government to MMDAs currently consist of; (i) transfers for salaries, (ii) District Assemblies Common Fund (DACF) (iii) transfers from highly indebted poor countries (HIPC) debt relief and (iv) various donor funds.

377. Sector departments outside the MMDAs, e.g. Education at the MMDA-level, and the core areas of services delivery are funded by a complex system of GOG, Statutory funds, Donor Funding, and other funding sources.

378. The ***Size of Transfers*** do not generally match the levels of costs incident on MMDAs for providing municipal services. While environmental sanitation services consistently absorbs greater than 35% of the revenue of many MMDAs, there has generally not been any assessments of the adequacy of funds transferred against the services provided.

379. The 5% DACF share was set arbitrary in 1994 without link to the actual services provided by MMDAs and has not been adjusted until recently (February 2008). The considerations for any adjustments and the new level of 7.5% are not clearly provided vis-à-vis services provided by MMDAs.

380. Data on grants to MMDAs vary from sector ministries and agencies and needs to be reconciled with those of the MoFEP. Table 3.22 gives aggregated MMDA accounts submitted to MLGRD on utilized funds from actual transfers for 2004.

Table 3.22: Grants and Donor Support MMDAs (GH¢

Source	2004	2004 share in %
DACF	61.91	51.8%
HIPC	32.18	26.9%
Donor Support (1)	13.87	11.6%
Salaries	11.55	9.7%
Total	119.51	100.0%

Source: Data from MLGRD(1) an example of this is DWAP funds supported by CIDA

381. The ***District Assemblies Common Fund (DACF)*** is stipulated by Article 252 of the 1992 Constitution and it is to receive an annual financial allocation by Parliament of not less than 5 percent of total GOG revenues. The DACF is the largest funding source for the MMDAs and constitute more than 50% of the total transfers to MMDAs. Between 1994 and 2006 the DACF has disbursed a total of GH¢435 million. Funding from the DACF is to be used mainly for development (capital) investment, and is expected to be a net addition to MMDAs resources and not a substitution for any other central government grants.

382. Table 3.23 shows the disbursement of the DACF over the period 1994 to 2006. Other beneficiaries are the MPs and the 10 RCCs, the Reserve Fund, the DACF office and the allocation to the Special Sanitation Fund. In most recent years, arrears from previous years have been paid in installment in addition to the annual basic allocations.

383. The DACF allocation to the Special Sanitation Fund was meant to support MMDAs to improve environmental sanitation services. In recent times, the fund has been used mainly to support the five largest MMDAs who are perennially in arrears of payment to refuse collection contractors. Table 3.24 shows the allocations of DACF to the Special Sanitation Fund and the proportion given to the five largest MAs of Accra, Kumasi, Sekondi-Takoradi, Tamale and Tema over the period 2004 – 2005.

384. The DACF (currently 7.5% of total tax revenue) is shared according to a transparent formula approved by parliament every year and applied according to the guidelines prepared and submitted by MLGRD in consultation with the MoFEP.

385. As part of the ***Highly Indebted Poor Countries' (HIPC)*** initiative funds from this source was introduced in 2002 earmarked for specific projects that are expected to impact on poverty reduction. The HIPC uses different allocation criteria, planning and budgeting guidelines and reporting system from the DACF. HIPC funds are also transferred through the sector ministries for specific interventions at the MMDA level e.g. schools have been constructed and boreholes drilled with funds routed through the MLGRD (see Table 3.25).

Table 3.23: Overview of the DACF Releases to MMDAs

Year	Total DACF Fund Released	Released to MMDAs only	Difference	Comments
	GH¢	GH¢	GH¢	
2004	85,717,200	75,545,936	10,171,264	Part of this as arrears from previous years
2005	70,191,700	58,567,632	11,624,068[26]	
2006	139,161,500	97,446,512	41,714,988	
2007	148,389,400	95,855,350	52,534,050	
2008	252,075,728	Not yet available		

Source: www.commonfund.com.gh/index; 2008 data not yet available.

[26] The figures vary greatly from source to source. From the Financial statements submitted to the MLGRD, it appears that the MMDAs have received ¢619,098,572,787 in 2005. From the annual report of DACF to parliament, the figure for MMDAs spending is ¢684 billion. Other beneficiaries are the MPs and the 10 RCCs, the Reserve Fund, the DACF office and funding to the National Sanitation Programme.

Table 3.24: Details of DACF and other Transfers to Special Sanitation Fund

Year	DACF	HIPC	Total	Comments
	GH¢	GH¢	GH¢	
2005	7,019,170		7,019,170	
2006	14,513,659		14,513,659	
2007	12,199,356	5,890,786	18,090,142	
2008	15,525,000	37,196,949	52,721,949	

Table 3.25: Total HIPC Funds Released to MMDAs

	GH¢	Per MMDA
2002	11,782,900	
2003	53,937,400	
2004	94,006,363	32,183,739
2005	57,619,949	
2006	93,620,484	29,665,755
2007	82,991,636	27,862,352
2008	79,663,443	

3.8.5 Donor Funding

386. Donor funding of environmental sanitation is very significant. Donor Support is transferred on-budget (e.g. CIDA supported DWAP, DANIDA – LSDGP etc) or off-budget (many other Donor supported programs and projects). The on-budget part alone constituted 11% of the total transfers to MMDAs in 2004, but the funds vary greatly across the MMDAs and there is no common system, so far, to ensure an effective country-wide equalization in distribution.

387. The preparation of the Strategic Environmental Sanitation Investment Plan (SESIP), to finance the NESSAP, is expected to provide the necessary framework for comprehensive financing of improvements in environmental sanitation projects through District-Medium Term Development Plans (MTDPs).

388. Table 3.26 gives an indication of levels of funding available to environmental sanitation in Ghana for 2007 with budgets and actual expenditures. The funds under the GoG/IDA-financed Urban Environmental Sanitation Project (UESP Phase II) and the District-Based Water and Sanitation (DBWS) component of the Danida-financed Water and Sanitation Sector Support Programme (WSSPSII) include provision of household and institutional latrines. The figure from Water Aid includes mainly costs for household latrines, institutional latrines and to an extent hygiene promotion.

Table 3.26: Sanitatioin Investments and Operational Costs in Ghana in 2007

Financing Source	Budget (US $)	Expenditures (US $)	Percentage (%)
UNICEF	60,000	NA[27]	NA
UNICEF/EU Application	957,400	NA	NA
Urban Environmental Sanitation Project-II (UESP, Phase II) (including GoG 10% contribution - US $ 1,110,000) (WB and AFD)	16,710,000	4,612,172	27.6
District Based Water and Sanitation (DBWS, Danida)	2,079,702	2,054,154	98.8
Water Aid	99,466	NA	NA
Policy, Monitoring, and Management Support (PMMS, Danida)	59,300	54,395	91.7
Support to Establishment of the Environmental Health and Sanitation Directorate (RNE)	681,655	410,431	60
MLGRD	540,652	397,243[28]	73.5
Total	21,188,175	7,528,395	NA

Source: Annual Progress Report, RNE Support to Establishment of EHSD, WSSPSII Sector Advisor (PEM Consult), January 2007

389. This rough estimate indicates budgeted sanitation investments and operational costs of US $ 21,188,175 for 2007. As can be calculated from the figures, GoG is roughly contributing with 7.8 % in the sanitation sector, which corresponds to their input to the UESP-II and the budget of Environmental Health and Sanitation Directorate, which also include the salaries and operational budgets of the REHUs. Apart from that, the salaries of district personnel working with sanitation are not included, as well as sanitation expenditures at municipality level. Furthermore, the investments in household and institutional latrines financed by HIPC funding and other national funding by CWSA, is not included.

390. Table 3.27 also provides indicative levels of funding allocated to the water and environmental sanitation sectors. The figures are indicative only of the level of financing to the various components of environmental sanitation and the sub-sector (i.e. whether rural and small town, or urban).

[27] Details from UNICEF and Water Aid yet to be obtained.
[28] Emoluments are extrapolated from end of September 2007 figures.

Table 3.27: Major Environmental Sanitation Projects and Sources of Funding

Source of Financing/Funding Agency	Category of DP			Project Description	Project Components										Past Projects		On-going & Pipeline Projects	
					Water			Environmental Sanitation							1995 - 1999	2000 - 2004	2004 - 2010	up to 2007
	NGO	Bilateral	Multilateral	Name of Project (actual start & end dates)	Rural	Small Towns	Urban	Solid Waste Management	Excreta Management	Drainage & Sullage	Health-Care & Industrial Wastes	Education and Enforcement Mgt	Policy & Insitutional Strengthening		Approx. Investment (US$m)	Approx. Investment (US$m)	Approx. Investment (US$ m)	Approx Amount Disbursed $m)
AFD		?		UESP II				√	√	√	?	?	?		?	13	33, 900,000	0.6
				PERI-URBAN WATER AND SANITATION (2009 – 2013)	√	√	√	?				√	?		?	?	5.22	?
DUTCH/ORET/NIO		?		CAPE COAST WATER (JUNE 2005 - DEC 2007)	?	?		?	?	?	?	?	?				54.36	44.39
						?	√	?					?					
				BAIFIKROM WATER (AUGUST 2005 – 2008)		?		?	?	?	?	?	?				35	21.07
					?	?	√	?	?	?	?	?	?					
				KWANYANK (JULY 2005 - DEC 2008)	?	?		?	?	?	?	?	?				38.3	34.84
					?	?	√	?	?	?	?	?	?					
				ODAW DRAINAGE (SEP 2003 - .....)	?	?		?			?	?	?			35.3		32.79
					?		?	?	?	√	?	?						
				BAREKESE (MAY 2007 - ….)	?	?		?					?				50.8	10.26
					?	?	√	?					?					
				TAMALE WATER (2006 – 2009)	?	?		?	?	?	?	?	?				61.02	34.73
					?	?	√	?	?	?	?	?	?					
K_FW			?	RURAL WATER SUPPLY IN ASHANTI				?	?	?	?	?	?				15.6	6.45
					√	?	?	?	?	?	?	?	?					
				RURAL WATER SUPPLY IN	√	?	?	?	?	?	?	?						3

Table 3.27: Major Environmental Sanitation Projects and Sources of Funding

Source of Financing/Funding Agency	Category of DP			Project Description	Project Components								Past Projects		On-going & Pipeline Projects	
					Water			Environmental Sanitation					1995 - 1999	2000 - 2004	2004 - 2010	up to 2007
	NGO	Bilateral	Multilateral	Name of Project (actual start & end dates)	Rural	Small Towns	Urban	Solid Waste Management	Excreta Management	Drainage & Sullage	Health-Care & Industrial Wastes	Education and Enforcement Mgt	Policy & Insitutional Strengthening	Approx. Investment (US$m)	Approx. Investment (US$m)	Approx. Investment (US$ m)	Approx Amount Disbursed $m)
				VOLTA & EASTERN REGIONS				?	?	?	?	?			19.9		
ARRDO		?				?	?	?	?	?	?	?	?				
CIDA		√			?	?	?	?	?	?	?	?					
DANIDA		√		WATER & SANITATION SECTOR PROGRAMME SUPPORT PH. II (2004 - 2008)	√	√	?		√			√	√			56.7	
DFID		√			?	?		?	?	?	?	?	?				
EU			√		?	?	?	?	?	?	?	?	?				
GTZ			?		?	?	?	?	?	?	?	?	?				
JICA		√			?		?	?	?	?	?	?					
IFAD		?			?	?	?	?	?	?	?	?	?				
UNICEF			√		?	?	?	?	?	?	?	?	?				
IBRD/IDA			√	UESP-I ('96 - 2002)	?	?	?	?	?	?	?	?	?				
			?	UESP-II	?	?	?	?	?	?	?	?	?				
AfDB			√	Accra Sewerage Improvement Project	?		√	?	?	?	?	?				4.4	
Water Aid	√				?		?	?	?	?	?	?					
GoG - (HIPC)	?				?		?	?	?	?	?	?	?				

Table 3.27: Major Environmental Sanitation Projects and Sources of Funding

Source of Financing/Funding Agency	Category of DP			Project Description	Project Components									Past Projects		On-going & Pipeline Projects	
					Water			Environmental Sanitation						1995 - 1999	2000 - 2004	2004 - 2010	up to 2007
	NGO	Bilateral	Multilateral	Name of Project (actual start & end dates)	Rural	Small Towns	Urban	Solid Waste Management	Excreta Management	Drainage & Sullage	Health-Care & Industrial Wastes	Education and Enforcement Mgt	Policy & Insitutional Strengthening	Approx. Investment (US$m)	Approx. Investment (US$m)	Approx. Investment (US$m)	Approx Amount Disbursed $m)
GoG - (DACF)	☐				☐		☐	☐	☐	☐	☐	☐	☐				
GoG – NYEP	☐				☐		☐	☐	☐	☐	☐	☐	☐				
Royal Netherlands Embassy (RNE)	☐				☐		☐						☐				
Ricerce Cooperazione																	
Totals														0	13	292.64	122.67

4 National Objectives and Strategies

4. National Objectives and Strategies

391. This section of the NESSAP proposes the planned broad strategies to meet the objectives and measures defined to overcome the challenges of the environmental sanitation sector. The key policies and actions are derived from, among others, the MTDPF (2010 – 2013) and the GPRSII, decentralisation framework and the Environmental Sanitation Policy (Revised, 2009). These are discussed briefly in the following sections.

4.1 The Medium Term Development Policy Framework (MTDPF, 2010 – 2013) and Growth and Poverty Reduction Strategy (GPRS-II)

392. Environmental sanitation is considered as a major component within the national development framework. While GPRSII strategized to ensure the right to basic services such as health-care, safe drinking water, sanitation and decent housing that improve the well-being of all Ghanaians the current MTDPF has prioritised the accelerated development of basic infrastructure to facilitate the production of goods and services.[29].

393. The MTDPF under the Expanded Development of Production Infrastructure pillar proposes a number of strategic approaches, including (i) the acceleration of the provision of excreta management facilities, especially at the household level (ii) improving physical and land-use planning with emphasis on the acquisition of land for the treatment and disposal of wastes in major towns and cities, (iii) promotion of recycling and cost recovery principles in waste management and (iv) establishing a Fund for Environmental Sanitation.

4.2 Decentralisation

394. The Constitution of the Republic of Ghana under Section 240 (1) states that "Ghana shall have a system of local government and administration which, shall as far as practicable, be decentralized". Section 241 (3) reiterates that "Subject to this Constitution, a District Assembly shall be the highest political authority in the district, and shall have deliberative, legislative and executive powers". Decentralized administration also places the oversight of implementation of all policies, plans, programmes and projects for all services under the jurisdiction of MMDAs.

395. The Local Government Act, 1993 (Act 462) provides the core regulation for the administration of local governments in Ghana while the National Development Planning (System) Act, 1994 (Act 480) lays out the development planning functions of MMDAs.

396. The above provide the basic tenets for the development of this NESSAP – policy objectives and actions will only provide an initial national framework subject to further refinements by actual and realistic strategies and targets for implementation by each MMDA. Therefore District Environmental Sanitation Strategies and Action Plans (DESSAPs) will provide the local level strategies, plans, programmes and sub-projects that will be considered as part of District's Medium-Term Development Plans.

397. In terms of presence within the lower-tier levels of MMDAs, the Environmental Health and Sanitation Directorate is the most decentralized of all departments in Ghana with offices and/or operational staff at all levels including Sub-Metropolitan Districts, Zonal, Town and Area Councils.

[29]MTDPF (2010 – 2013), NDPC, 2009.

4.3 Human Settlement and Related Issues

398. In the consideration of the broader national planning objectives, the issues of human settlement and land use planning as well as zoning regulations are important. According to the State of Environment report (EPA, 2005), Ghana's growing population is exerting immense pressure on land as well as creating environmental sanitation problems, particularly in the major towns and cities. The environmental problems associated with urban overpopulation are those that have direct bearing on human health, such as basic sanitation and disposal of waste, shortage of essential facilities and disregard of approved land use allocations. Other problems are overcrowding, poor and inadequate transportation.

399. The State of Environmental Health for GAMA (Songsore, J. et al, 2001) showed that the environmental burdens associated with inadequate sanitation facilities tend to be minimal in planned residential areas because of adherence to zoning regulations. By contrast, sanitation conditions tend to get worse in unplanned low income residential areas because of inadequate provision of in-house toilet facilities and excessive crowding around public toilets.

4.4 Underlying operational principles of the NESSAP

400. The NESSAP as stated above is a reflection of the objectives of the Environmental Sanitation Policy (Revised, 2009). Hence all the principles underlying the policy also apply to the NESSAP. In addition and in line with the considerations of sections, 4.1, 4.2 and 4.3 above, the NESSAP will be based on the following;

- Decentralised planning and implementation of interventions based on DESSAPs and MMDA's MTDPs;
- Pursuing institutional strengthening and capacity enhancement of the sector in line with programmes of the Local Government Service;
- Strategic Sanitation Approach – matching facilities with housing segments and affordability of residents;
- Targeting to reach total access for environmental sanitation through incremental achievements;
- Transparent means of sector performance assessment involving all stakeholders including civil society, NGOs, traditional authority, religious bodies and other professional associations;
- Enabling public-private-partnerships to flourish amid public regulation and fair refereeing by all stakeholders;
- Recognising the Public-and-Private "Good" nature of environmental sanitation services;
- Enhancing collaboration among key sector actors, especially harnessing the comparative strengths of regional-level entities[30] for effective facilitation of MMDAs within the coordinating mandates of RCCs.

401. The provision of improved environmental sanitation services is influenced largely by housing segments of an area. The type of housing segment and the growth in each type of predominant housing will largely affect required facilities. For example, in many newly developing areas, high cost areas and estates, improved excreta disposal facilities

[3030] The organization and management of the development of DESSAPs by MMDAs was effectively coordinated by RCC-level agencies. See Handbook on the Preparation of DESSAPs, EHSD/MLGRD, 2007.

are provided – and this is the trend in the housing market. Thus the challenge of improving services is skewed mainly, for urban areas, towards overcoming deficits in core low-income areas of large towns and for small towns.

4.5 Objectives of the Environmental Sanitation Policy (Revised, 2009)

402. The various strategies and action plans of the NESSAP are derived from the objectives and measures under the following policy focal areas[31] of the ESP, Revised 2010. The detail actions are presented in the various component action plans under section 4.6.

A. Capacity Development

403. In order to reflect the importance of environmental sanitation in our national development, there is the need for placing the sector among top priority areas of national agenda. This will require developing and strengthening capacity and raising the profile of agencies within the sector.

404. Proposed objectives for capacity development in environmental sanitation are:

(A1) To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates;

(A2) To strengthen coordination and collaboration among sector institutions;

(A3) To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services;

(A4) To ensure transfer of adequate resources to MMDAs for environmental sanitation functions;

(A5) To mainstream the management of the mitigation of marine pollution in environmental sanitation strategies

B. Information Education and Communication

405. Attitudinal and behavioural change is central to achieving sustainable progress in environmental sanitation. Therefore, environmental sanitation education, effective communication and dissemination of information are considered as integral elements of all environmental sanitation activities. Whilst environmental education is not in itself sufficient to ensure improvements in environmental sanitation, neither is the provision of sanitary infrastructure and services unless they are properly used.

406. Awareness raising and participatory engagement of all stakeholders to ensure informed-decision making on policies, plans and programmes is also critical. The philosophy of *materials in transition* (MINT) is also informed by these considerations, among others.

407. Objectives proposed to achieve the above include:

(B1) To raise awareness on the Environmental Sanitation Policy (Revised, 2009).

(B2.)To raise the awareness of the benefits of improved environmental sanitation especially as related to health, food hygiene and general environment

(B3) To provide sector-wide standards for service provision, taking into consideration local conditions and needs

[31] The detail list of objectives and actions under the key focus areas are provided in the Revised Environmental Sanitation Policy (2009). These are also repeated under section 4.

(B4.) To raise awareness on the increasing waste levels associated with growing economy and related lifestyle changes

(B5) To raise awareness of the importance (functions and benefits) of wet lands and water courses

(B6.) To enable effective community participation in the sitting of environmental sanitation facilities

C. Legislation and Regulation

408. Environmental sanitation reflects the way of life of a society. Given the prevailing high levels of non-compliance with laid down environmental sanitation rules and regulations, there is the need to reinforce the legal regime and its enforcement. The roles of the judiciary and law enforcement agencies are of critical importance in this regard.

409. Law enforcement shall play complementary role to objectives and actions proposed for IEC and for service provision. The proposed objectives are:

(C1) To develop legislation in support of institutional structures required for managing environmental sanitation

(C2.) To make available to all sector actors updated sector-wide standards, laws and regulations on environmental sanitation

(C3.) To mainstream alternative uses of wastes (liquid and solid) through appropriate technologies and incentives

(C4.) To institute regulatory mechanisms that safeguard wetlands and water courses;

(C5.) To safeguard groundwater from contamination from poor environmental sanitation practices

(C6.) To institute a means of incorporating, and adhering to, international conventions into domestic law

(C7.) To ensure effective regulation for prevention of transboundary dumping in a free-trade regime

D. Sustainable financing and cost recovery

410. In order to achieve the above, forward looking objectives are proposed, including;

(D1.) To ensure sustainable financing of environmental sanitation services

(D2.) To develop a strategy and financing plan with clear allocation of resources (and costs) for households, communities, MMDAs and central government;

(D3.) To improve public sector financing of environmental sanitation services

E. Levels of Service

411. The environmental sanitation needs of various target groups vary and so are the corresponding facilities and services that are provided. The underlying principle of ESP, Revised 2010 is to ensure that choices by all segments of the population for any

level of service reflect effective demand, while the choice of technologies for all levels of service adhere to regulations in order to safeguard public interest and the rights of all.

412. In order to achieve the above, the following objectives have been proposed:

(E1.) To effectively contain and decrease the negative impact from poor environmental sanitation

(E2.) To support adequate treatment and final disposal of all wastes;

(E3.) To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles

(E4.) To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste

(E5.) To meet the needs of vulnerable and physically challenged individuals in provision of services

F. Research and Development

(F1.) To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels

(F2) To support research in appropriate technologies to meet the needs of all segments of society, especially vulnerable and poor people

(F3.) To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles

G. Monitoring and Evaluation

413. To track policy implementation effectively and provide continuous improvement in responding to emerging challenges in the sector, the objectives and measures to be pursued include:

(G1.) To develop framework for monitoring and evaluation at all levels within the sector;

(G2.) To strengthen capacity to implement M&E;

(G3.) To develop a responsive reporting and feedback mechanism for M&E

4.6 Measures, action plans and strategies

414. As discussed in previous chapters, the measures and action plans of the NESSAP are derived from the objectives under the various focus areas of the Environmental Sanitation Policy (Revised, 2010. Each measure has been classified as either general, and therefore cuts across all the components of environmental sanitation, or is relevant to a specific component of environmental sanitation.

415. In the following sections, the generic strategies and action plans are discussed first, followed by those specific to the defined components of environmental sanitation. Where the same general measures are applicable for specific components, these are not repeated.

4.6.1 Capacity Development

416. ESP, Revised 2010 identifies capacity development as a critical element for improving environmental sanitation services (a key component of the "green economy"). The decline in coverage of services from the late 1970's has continued and worsened. To overcome the deficit and make rapid progress require that there is urgent and scaled-up capacity enhancement within the sector.

417. The measures and actions as well as the corresponding time-frames proposed for achieving the policy objectives of the Capacity Development focus area are presented in Table 4.1. The key strategies related to the proposed measures and actions are in the following sections.

418. In the ***short-term*** institutional strengthening focuses on the establishment of the Environmental Health and Sanitation Department (EHSD) in the Ministry of Local Government and Rural Development (MLGRD). During the latter part of 2007, a review of institutional development was carried out and a training plan developed. Formal approval of the proposed scheme of service for staff of the EHSD will be pursued.

419. To ensure improved funding for curriculum development and infrastructure improvements efforts to place Schools of Hygiene under the Ministry of Education, (MoE) will be initiated.

Table 4.1: Focus Area: Capacity Development						
General Measures						
Objective	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
A1- To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates	Establish Environmental Health and Sanitation Directorate in MLGRD including updated scheme of service and mandates	MLGRD	OHCS/MSD	Sept 2010		
	•Approve structure of EHSD	OHCS		Dec. 2010		
	•Update and approve scheme of service for EHSD in line with Local Government Service Act, 2003 (Act 656)	MLGRD	OHCS/MSD	Dec. 2010		
	•Review of institutional development, capacity building and training plan for EHSU	MLGRD	EHSD	Nov 2007		
	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff	MLGRD	MoFEP	March 2015		
	•Upgrade ICT Equipment etc	MLGRD	EHSD	April 2008		
	•Enhance facilitation capacity of REHOs (training, mobility etc.)	MLGRD	EHSD/MoFEP	2008 – 2011		
	•Appoint 1 Environmental Health Technologist per district by 2020	MLGRD	EHSD/MoFEP		2020	
	•Appoint 1 Drainage Maintenance Engineer per Metropolitan and Municipal Assembly by 2015					
	•Appoint 1 Public Health Engineer per Metropolitan and Municipal Assembly by 2015					
	•Appoint 1 Planner per REHSD by 2015	MLGRD	EHSD/MoFEP	2015		
	•Appoint 1 Public Health Engineer per REHSD by 2015	MLGRD	EHSD/MOFEP	2015		
A2- To strengthen coordination and collaboration among sector institutions	Review membership and mandates of NESPoCC	MLGRD	EHSD	July 2007		
	Provide necessary logistics and funding for NESPoCC activities, to begin in Nov. 2007 and sustained	MLGRD	EHSD	Nov 2010		
A3- To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services	Upgrade Schools of Hygiene to tertiary institutions for Hygiene and Environmental Sanitation – including curriculum, structure and staffing	MLGRD	MoE/MoH	2012		
	•Review curriculum and training courses of SH	MLGRD	MLGRD/MoH	Nov 2008		
	•Restructure SHs and place under MoE	MLGRD	MoH/MLGRD	Jun 2011		

Table 4.1: Focus Area: Capacity Development						
General Measures						
Objective	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
	•Upgrade SH to tertiary institutions	MoE	MLGRD/EHSD	Jul 2012		
	Provide specialised training in the areas of environmental protection, contract management and supervision, planning, public relations, monitoring and evaluation	MLGRD	EHSD	2008 – 2010		
	Mainstream the use of ICT through training to enhance information management	MLGRD	MoC	2008 – 2012		
A4- To ensure transfer of adequate resources to MMDAs for environmental sanitation functions	Provide logistics and appropriate working tools for management of environmental sanitation services	MMDAs	MLGRD	2011		
Specific Component Measures: Solid Waste Management						
A1- To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff	MLGRD	EHSD	2015		
A3- To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services	Reinforce the role of the private sector in service delivery - Minimum targets of collection and transport by private operators in five largest cities, through franchise/contracting •75% in year 2010; •90% in year 2015; •100% in year 2020.	MMDA	MLGRD/EHSD	As indicated		
A3- To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services	Reinforce the role of the private sector in service delivery - Minimum targets of collection and transport by private operators, for all other district capitals, through franchise/contracting •60% in year 2015; •75% in year 2020; •100% in year 2025.	MMDA	MLGRD/EHSD	As indicated		
A4- To ensure transfer of adequate resources to MMDAs for	Appoint appropriately qualified staff to MMDAs including, sanitary engineers, environmental health technologists, planners etc			2015		

Table 4.1: Focus Area: Capacity Development						
General Measures						
Objective	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
environmental sanitation functions						
Specific Component Measures: Excreta (Wastewater) Management						
A1- To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff	MLGRD	EHSD			
A3- To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services	Reinforce the role of the private sector in service delivery •Increase the proportion of public toilets provided by private sector through BOT, BOO from…to ….by 2015 •Implement full franchise management of all MMDAs built facilities by 2015 •Implement 100% private desludging services by 2015	MMDAs	MLGRD	As indicated		
	•Minimum targets for home-latrine coverage through promotion by trained artisans (accompanied by Community-led Total Sanitation, CLTS) • 15% by 2010 • 35% by 2015 • 70% by 2025 • 90% by 2035	MMDAs	EHSD/MLGRD	2010		
	•Support installation of bio-digesters and packaged plants by private operators					
A4- To ensure transfer of adequate resources to MMDAs for environmental sanitation functions	Appoint appropriately qualified staff to MMDAs including, sanitary engineers, environmental health technologists, planners etc			2015		
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
A1- To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff •Implement training programmes for drainage	MLGRD	HSD	2015		

Table 4.1: Focus Area: Capacity Development						
General Measures						
Objective	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
institutional mandates	planning and maintenance management					
A4- To ensure transfer of adequate resources to MMDAs for environmental sanitation functions	Appoint appropriately qualified staff to MMDAs including, sanitary engineers, environmental health technologists, planners etc			2015		
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
A3- To develop capacity of the sector for effective facilitation of MMDAs and private sector for the provision of environmental sanitation services	Support effective implementation of ESICOME and related programmes •Update ESICOME programme to include CLTS by end-2011 •Implement Annual training programmes for REHSD and EHMDs in MMDAs commencing from 2009	EHSD	REHSD	2008 – 2015		
A5- To mainstream the management of the mitigation of marine pollution in environmental sanitation strategies	Update knowledge and skills of environmental health officers to deal with marine-pollution related issues	EHSD	GMA/EPA	2010		
	Review the mandates of port health inspections to include marine pollution	MLGRD	EHSD/MoJ&AGD/ EPA	2011		
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
A1- To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff by 2009 •Implement Annual training programmes for REHSD and EHMDs in MMAs in clinical/hazardous waste management commencing from 2010	EHSD	EPA	2009 – 2015		
A4- To ensure transfer of adequate resources to MMDAs for environmental sanitation functions	Appoint appropriately qualified staff to MMDAs including, sanitary engineers, environmental health technologists, planners, chemical technologists etc	MLGRD	EHSD		2020	

420. Part of the short-term capacity enhancement has been the provision of office equipment and vehicles to all 10 Regional Environmental Health and Sanitation Directorates. In addition REHSDs will be trained to enhance supervision and facilitation of districts. Specialised training will be given to all categories of staff at national-, regional- and district-levels in environmental protection, contract management, services planning, public relations, monitoring and evaluation and prosecution will be provided as part of improving enforcement management.

421. The ***medium-term*** strategies are intended to improve the human resource base within the "green economy" sector. To ensure a steady supply of high grade "green collar" staff and stem the high rate of "cross-over" to other sectors due to lack of clear cut career progression, the Schools of Hygiene will be upgraded to tertiary institutions. At the same time, the scheme of service for the sector will be restructured to be in harmony with the Local Government Service and provide "space" for professionals from other disciplines such as planning, finance, sociology and communications that are essential for modernizing the management of the sector.

422. Attracting higher calibre staff into the environmental health and sanitation sector through improved conditions of service including well-defined career development path will be pursued.

423. In the ***long-term***, it is envisaged that building on the above strategies will enable the appointment of key staff including public health engineers and planners at REHSDs, public health and drain maintenance engineers at metropolitan and municipal assemblies, and at least one (1) environmental health technologist per district by 2020.

424. For *solid waste management*, ensuring improved productivity in collection and transport, and adoption of new and emerging technologies for final disposal, for example Reactor Landfilling (referred to as High-Density-Aerobic Landfills in the Ghana Landfill Guidelines) all have implications for service costs as well as effective management of landfill-gas (LFG) with or without energy recovery (i.e. waste-to-energy options).

425. The issues of *climate change* and the application of carbon-trading and -crediting as tools for gradually developing improved final disposal facilities have not received the required attention and opportunities available under the Kyoto Protocol, for example, have been missed. There is urgent need for a different mix of professionals with the requisite background experience and qualifications to enable the sector respond to these challenges and emerging trends. This will be achieved through capacity building and tailor-made on-the-job training for selected staff with the right aptitude.

426. From the early 1990's a lot of effort has been made to encourage ***private sector participation*** in environmental sanitation services. The AMA-GTZ project increased substantially the coverage of house-to-house services by introducing standardised wheeled-bins for refuse storage and commenced direct collection services through the use of compaction trucks. Around the same time pilot schemes were also implemented by private operators using non-motorised collection systems including donkey-carts and push-trucks to augment the proportion of fee-charging primary collection services through *franchise*.

427. From the late 1990's deliberate efforts were made to encourage the private sector to deliver substantial portion of collection and transport services following the successful application of the *contracting* method by Tema Municipal Assembly. The Urban Environmental Sanitation Project (UESP) series is supporting private sector delivery of not only collection/transport but also management of engineered landfills in the project cities.

428. To systematically pursue the agenda for privatising operations, it is expected that 75% or more of all solid waste collection and transport in the five largest cities will be through private operators, 90% by the close of 2015 and 100 by 2020. It is expected that all district capitals country-wide will follow suit and incrementally increase the proportion of services provided by the private sector.

429. To provide a benchmark for appraising the performance of all MMDAs in privatising refuse collection, transport and disposal requires that a baseline of existing services and their mode of delivery be determined. This exercise was launched as part of preparing the NESSAP.

430. Development of appropriate tools for monitoring and evaluation of privatised operations to ensure quality of service to households and the training of staff in contract/franchise management arrangements and procurement are all important facets of enhancing capacity of sector staff.

431. The basic capacity challenges of the sector regarding *excreta management* include training staff to manage a vigorous nation-wide scaling-up of home toilets promotion through emerging techniques such as Community-Led Total Sanitation (CLTS) to achieve modest country-wide target of 75% coverage by 2015. The skills of sector practitioners in designing and managing treatment facilities for faecal sludge and septage need to be improved. The latter is particularly important as many of the low-cost treatment facilities (faecal sludge and stabilization ponds, trickling filters, etc) installed are not functioning as desired.

432. The main strategies for the management of public and communal toilets are the full franchise management of all MMDA facilities and encouraging the private sector to build-operate and transfer or own public toilets by 2015.

433. An important aspect of managing public toilets is the handling and treatment of faecal sludges from such un-sewered facilities. The private sector will be supported to install bio-digesters and other packaged plants whose requirement for land is considerably less than ponds. Currently, the haulage and conveyance of faecal sludge and septage is largely provided by private cesspit emptier trucks in the largest cities, and it is proposed that full private sector delivery of desludging services be extended to all MMDAs by 2015. Guidelines for installation of treatment facilities and cesspit-emptier services will be developed in the short-term.

434. Street and road-side drain cleansing has been routinely provided by Waste Management or Environmental Health departments, as the case may be, in all MMDAs. However, the labour-intensive nature of the service has limited the provision of the service to only main thoroughfares around government offices and central-business-districts with the neglect, in particular, of community drains. The Department of Urban Roads (DUR) contracts out road-side drain cleansing as part of routine maintenance for road infrastructure but this is not regular as the pressure for new road projects often supersede maintaining drains seen as MMDA activity.

435. The inter-play between *Stormwater drainage and sullage conveyance*, solid waste and wastewater and implications for common ailments such as malaria and typhoid (see section 3.6) require that these services and related infrastructure be systematically improved as part of efforts at source prevention of such common disease vectors.

436. Restructuring of WMDs and EHMDs at MMDA levels to cater for staff with the right appreciation of planning for drains and drainage maintenance-management will be pursued. AMA has established a Drainage Maintenance Unit as part of recommendations of UESP and it is expected that the remaining four largest cities will follow suit. It is expected that as DAs establish their Environmental Health and Management Directorates and District Works Departments, units for drainage

management will be included and staff provided training in drainage planning and maintenance management.

437. Development of drainage plans and implementation of the priority interventions will be pursued through effective collaboration between Planning Departments responsible for physical and land-use planning, and WMDs/EHMDs/DWD of MMDAs. To enable integrated drainage basin planning and management, effective facilitation of such planning will be provided by Regional Hydrological Services Department and Regional Environmental Health and Sanitation Directorates with active support of Regional Planning Coordinating Units.

438. In order to lay the basis for effective and systematic *environmental sanitation education and enforcement management*, ESICOME will be maintained as a core programme for sanitary inspections and enforcement. An important aspect of this will be the incorporation of locally-adapted CLTS methods in ESICOME by the end of 2011.

439. During this period, the Capacity Enhancement and Training Plan prepared in 2007 together with training modules prepared and implemented as part of UESPII and RNE's support to "the Establishment of the Environmental Health and Sanitation Directorate" will be revisited to enhance staff capacity in prosecution, environmental assessment, services and financial planning. The effectiveness and scope of port-health inspections and the inclusion of issues on marine pollution will be assessed with the collaboration of appropriate agencies such as the National Maritime Authority.

440. At this stage sector capacity building on management of *health-care, industrial and hazardous wastes* will focus mainly on characterization of these waste categories and safe handling and treatment methods.

441. The MLGRD and EPA published guidelines on Management of Health-Care and Veterinary Wastes in 2002 to provide the basis for the safe segregation, packing, handling, storage, treatment, transportation, disposal and monitoring of health care waste whilst the MoH has recently published MoH's policy and guidelines on health-care waste. As part of short-term measures training of staff on the major components of clinical wastes and their handling will be carried out.

442. A programme for systematic gathering of information on industrial waste sources, composition and recycling potential will be carried out. For general industrial waste, the main strategy will be on recycling up to 25% of waste and gradually reducing the amounts transported to final disposal in line with MINT.

443. A special waste stream analysis for waste-electrical and electronic equipment (WEEE) will be instituted in 2011 to assess the feasibility of establishing WEEE centres in Ghana.

444. During the industrial waste characterization exercise, criteria and specific treatment methods will be assembled as part of guidelines to be developed and specialised advisory services instituted to support industrial and commercial sources of hazardous wastes.

4.6.2 Information, Education and Communication

445. Awareness raising for change of environmental sanitation behaviour is recognised as a cornerstone for achieving the objectives of the Environmental Sanitation Policy (Revised, 2009) and this NESSAP. The measures under the IEC focus area of the policy clearly supports this position and generally proposes a two-pronged approach. The first involves vigorous environmental sanitation education with public participation and building of partnerships among key stakeholders to change behavior of the population as well as towards all types of waste. The second involves enforcement and sanctioning procedures that effectively deter miscreants.

446. In the following sections the measures and action plans related to the Information, Education and Communication focus area are presented in Table 4.2. Details of proposed strategies and explanations to the planned actions for general and specific-component measures follow.

447. In the ***short-term*** implementation of the Communication Plan for the Environmental Sanitation Policy (Revised, 2009) will be pursued to ensure widespread dissemination. The national launch of the revised policy and the NESSAP is supposed to attract high-level political and sector leaders. Over the years the Environmental Sanitation Week has been celebrated and has led to some periodic cleanup campaigns. It is proposed that the day of the week designated as ENSADA should be statutorily declared a clean-up day to provide it a legal basis and improve participation by citizens.

Table 4.2: Focus Area: B. Information, Education and Communication						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
B1- To raise awareness on the Environmental Sanitation Policy (Revised, 2009).	Ensure widespread dissemination of policy at all levels	MLGRD	MOI, ISD/MMDAs	2010 - 2012		
B2- To raise the awareness of the benefits of improved environmental sanitation especially as related to health, food hygiene and general environment	Raise the profile of the Environmental Sanitation Day (ENSADA) by declaring it a statutory cleanup day at all levels	MLGRD	MoJ&AGD (Parliamentary select committee LG)	2009		
	Every community shall adapt environmental sanitation practices consistent with the national environmental sanitation policy	MMDAs	ISD	2009 - 2010		
	Promote awareness of the important roles of households, communities and the private sector in environmental sanitation services (annual campaigns)	MMDAs	ISD/NCCE		2009 -2020	
B3- To provide sector-wide standards for service provision, taking into consideration local conditions and needs	Develop and/or update standards and guidelines for all components of environmental sanitation services at all levels and segments	EHSD	NESPoCC	2010		
	Ensure widespread dissemination of all standards and guidelines	MLGRD	EPA/MMDAs/ISD	2012		
	Carry out periodic training of sector staff on standards and guidelines	MLGRD	EPA/EHSD	2009 - 2012		
	Establish monitoring and evaluation framework for implementation of standards and guidelines (including the use of environmental sanitation assessments and audit procedures)	EHSD	REHSD/MMDAs/ TCPD/EPA	2009		
B4- To raise awareness on the increasing waste levels associated with growing economy and related lifestyle changes	Ensure the involvement of traditional authorities and the consideration of diversity of religious beliefs and cultural practices at all levels	MLGRD	MoCC/MMDAs/NCCE	2009 - 2010		
Specific Component Measures: Solid Waste Management						
B4- To raise awareness on the increasing waste levels associated with growing economy and related lifestyle changes	Promote benefits of alternative uses of wastes through Reduction, Re-use, Recycling and Recovery (annual campaigns)	MLGRD	MoE/CSIR/EPA/MoI&DR			2009 -2024
	Promote use of biodegradable materials and minimise use of plastics (annual campaigns)	MLGRD	CSIR/EPA			2009 -2024

Table 4.2: Focus Area: B. Information, Education and Communication						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
B6- To enable effective community participation in the sitting of environmental sanitation facilities	Develop and apply participatory tools for identification and selection of sites in accordance with strategic environmental assessment principles	MLGRD	EHSD/EPA	2009		
	• Train sector staff in application of SEA tools	MLGRD	EHSD/EPA			2009 -2024
Specific Component Measures: Excreta Management						
B6- To enable effective community participation in the sitting of environmental sanitation facilities	Develop participatory tools for identification and selection of sites in accordance with strategic environmental assessment principles	MLGRD	EHSD/EPA	2009		
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
B5- To raise awareness of the importance (functions and benefits) of wet lands and water courses	Support advocacy on interventions aimed at restoring and improving wetlands and watercourses, including those in the National Water Policy, National Wetlands Strategy etc	MLGRD	HSD/EHSD/MLF &M	2010 - 2011		
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
B2- To raise the awareness of the benefits of improved environmental sanitation especially as related to health, food hygiene and general environment	Every community shall adapt environmental sanitation practices consistent with the national environmental sanitation policy	MLGRD	EHSD/MoJ&AGD/ ISD/MoE	2009 - 2010		
B4- To raise awareness on the increasing waste levels associated with growing economy and related lifestyle changes	Develop framework for raising awareness on volumes and types of waste streams generated from all segments of the economy and their impacts	MLGRD	EPA/MoTI/MoFEP /MoH	2009 - 2010		
	Support advocacy on effects of changing life-styles on waste streams	MoI	MLGRD/NCCE	2009 - 2010		
	Promote benefits of alternative uses of wastes through Reduction, Re-use, Recycling and Recovery (annual campaigns)	MLGRD	EPA/CSIR			2009 -2020
	Promote use of biodegradable materials and minimise use of plastics (annual campaigns)	MLGRD	EPA/CSIR			

Table 4.2: Focus Area: B. Information, Education and Communication						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
B5- To raise awareness of the importance (functions and benefits) of wet lands and water courses	Support advocacy on interventions aimed at restoring and improving wetlands and watercourses, including those in the National Water Policy, National Wetlands Strategy etc	MLFNR&M	MMDAs/EPA	2010 - 2011		2009 -2020
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
B6- To enable effective community participation in the sitting of environmental sanitation facilities	Develop participatory tools for identification and selection of sites and installation of treatment facilities in accordance with strategic environmental assessment principles	EPA	MLGRD/MoH/ MoTI Universitities/CSIR	2009		

448. As part of short-term measures existing guidelines and those to be updated/developed, will be disseminated widely and the roles of all stakeholders highlighted adequately. It is expected that practices at all levels including, communities, will be in line with national standards. Capacity building and training of sector staff on standards and guidelines as well as on Result-Based Monitoring and Evaluation (R-BM&E), environmental assessments and auditing will be provided.

449. A core strategy in disseminating the revised policy and measures will be the involvement of traditional authority and religious bodies in advocacy on civic rights and responsibilities regarding environmental sanitation services.

450. The different means of achieving the policy objective of *Reduction, Re-use, Recycling and Recovery* (4Rs) is now gaining attention. An essential element for institutionalising these pathways is to promote the results of value-chain analysis of the various components of wastes streams and the concept of "MINT", hence the title of this document. The promotion of alternative biodegradable packaging materials instead of plastics will also be pursued as part of medium- to long-term measures.

451. Active engagement of stakeholders and their participation in decision-making-and-taking have proven to be effective tools in disseminating intended plans. In the area of solid waste and excreta management, selection of sites for final disposal and installation of low-cost treatment facilities has remained very challenging. Routine application of tools, such as SEA, that enable engagement of non-experts in decision-taking will be pursued.

452. The pollution of watercourses, wetlands, lagoons and rivers from point and non-point sources is threatening the quality of water available for abstraction for potable and other direct productive uses. A proposed core strategy is to support advocacy aimed at reclaiming and restoring wetlands and water bodies.

453. In the short- to medium-term, the core strategies for IEC have to deal with how *Environmental Sanitation Education and Enforcement Management* (ESEEM) is effectively achieved through the engagement and participation of individuals, households and communities.

454. The active participation of traditional authorities and religious bodies in support of advocacy on the effects of changing life-styles on waste streams generated from various sectors of the economy will be vigorously pursued.

455. Part of the ESEEM strategy will be to gather information of sources of waste and their tonnages or volumes based on community, area/zonal/sub-metropolitan areas and districts as well as on electoral and constituency basis. It is expected that the baseline information gathered as part of preparation of DESSAPs will contribute to the required information and hence a means for setting periodic (also annual) benchmarks and targets for meeting the aims of the MINT targets and the use of biodegradable alternatives.

4.6.3 Legislation and Regulation

456. The legislation and regulation focus is to provide a conducive environment that enables all stakeholders (service providers, households, institutions, industrial and commercial entities etc) to exercise their rights and responsibilities, within a responsive refereeing regimen.

457. The measures and actions as well as the corresponding time-frame proposed for achieving the policy objectives of the Legislation and Regulation focus area are presented in Table 4.3. The key strategies related to the proposed measures and actions follow.

Table 4.3: Focus Area: C Legistation and Regulation						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
C1- To develop legislation in support of institutional structures required for managing environmental sanitation	Ensure enactment of necessary legal instruments to support institutional functions including public-private partnerships, financing and funding arrangements, licensing, monitoring, control and ownership, of wastes, point and non-point discharges	MLGRD	EPA/MJ&AG	2011		
C2- To make available to all sector actors updated sector-wide standards, laws and regulations on environmental sanitation	Enact, disseminate and enforce laws and regulations governing sector-wide standards (commencing from 2009)	MLGRD	EPA	2010 – 2015 (continuous)		
Specific Component Measures: Solid Waste Management						
C1- To develop legislation in support of institutional structures required for managing environmental sanitation	Identify (enact) appropriate legislation on the acquisition of land for treatment and disposal sites (including expropriation) and develop procedures to facilitate site valuation, negotiation and payment of compensation	MLGRD	TCPD/LVB	2011		
C2- To make available to all sector actors updated sector-wide standards, laws and regulations on environmental sanitation	Develop regulation to support waste reduction, re-use, recycling and recovery	MLGRD	EPA/MoTI	2011		
C4- To institute regulatory mechanisms that safeguard wetlands and water courses;	Enforce legislations/regulations/bye-laws prohibiting the dumping of waste in wet lands and water courses (including drains)	MLGRD	EPA/MLF&M/ MWRWH	2010		
Specific Component Measures: Excreta Management						
C1- To develop legislation in support of institutional structures required for managing environmental sanitation	identify appropriate legislation on the acquisition of land (incl expropriation) for treatment and disposal sites and develop procedures to facilitate site valuation, negotiation and payment of compensation	MLGRD	MLFNR&M	2010		
C2- To make available to all sector actors updated sector-wide standards, laws and regulations on environmental sanitation	Develop regulation to support waste reduction, re-use, recycling and recovery	MLGRD	EPA/MoTI	2011		

Table 4.3: Focus Area: C Legistation and Regulation						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
C3- To mainstream alternative uses of wastes (liquid and solid) through appropriate technologies and incentives	Enforce legislations/regulations/bye-laws prohibiting the dumping of wastes in wet lands and water courses (including drains), commencing from 2008	MLGRD	EPA/MLF&M/ MWRWH			2008 –2024
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
C3- To mainstream alternative uses of wastes (liquid and solid) through appropriate technologies and incentives	Enforce legislations/regulations/bye-laws prohibiting the dumping of wastes in wetlands and water courses (including drains), commencing from 2008	MLGRD	MRT			2008 –2024
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
C1- To develop legislation in support of institutional structures required for managing environmental sanitation	Identify all existing and proposed institutional arrangements that require legal backing for effectiveness	MLGRD, EPA	EHSD/LGS	2011		
C2- To make available to all sector actors updated sector-wide standards, laws and regulations on environmental sanitation	Ensure that all developments comply with EPA environmental assessment regulations	MLGRD	EHSD/EPA/TCPD	2012 – 2015 (continuous)		
	Support the strengthening of the capacity of the judiciary and law enforcement agencies in dealing with environmental sanitation and related issues	MJ&AGD	MLGRD	2012 – 2015		
	MLGRD develop model bye-laws covering all aspects of environmental sanitation	MLGRD	EHSD	2009		
	MMDAs shall promulgate bye-laws consistent with model bye-laws taking into consideration specific local conditions	MMDAs	EHSD/REHSUs	2009		
C4- To institute regulatory mechanisms that safeguard wetlands and water courses;	Enforce legislations/regulations/bye-laws prohibiting the dumping of waste in wet lands and water courses (including drains)	MMDAs	EPA			2009 –2024
C5- To safeguard groundwater from contamination from poor environmental sanitation practices	Enforce existing statutes and regulations on prevention of pollution of ground water sources	MMDAs	MLGRD/ MWRWH			2009 –2024
C6- To institute a means of incorporating, and adhering to,	Institute adequate measures to protect beaches and prevent marine pollution	MMDAs	MLGRD/ MWRWH/MRH	2010 – 2011		

Table 4.3: Focus Area: C Legistation and Regulation						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
international conventions into domestic law	Develop rapid response systems for adopting emerging international regulations on issues such as global warming, e-waste and special hazardous waste etc	EPA	MJ&AGD/ MLGRD	2012		
C7- To ensure effective regulation for prevention of transboundary dumping in a free-trade regime	Enforce anti-dumping conventions and protocols (continuous)	EPA	MJ&AGD			2008 –2024
	Enforce/Enact statute for compulsory participation of environmental sanitation officers in destination inspections at entry points	MLGRD	MoH/MoFEP	2011		
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
C1- To develop legislation in support of institutional structures required for managing environmental sanitation	Identify appropriate legislation on the acquisition of land (including expropriation) for treatment and disposal sites and develop procedures to facilitate site valuation, negotiation and payment of compensation.	MLGRD	EPA/EHSD/TCPD	2011		

458. In the ***short-term*** the strategy will focus on assessing existing relevant laws to identify gaps and enact appropriate instruments where necessary. Typical areas that need to be catered for include giving legal backing to Environmental Health and Management Departments as provided for in the Revised ESP, REVISED 2010; providing model bye-laws to support service delivery by private operators e.g. declaration of franchise areas; providing legal instruments for enforcing "polluter-pays-principle" at all levels; giving legal backing to operational principles regarding control and ownership of wastes.

459. In order to apply and adhere to the various levels of service, sector-wide standards will be developed and given appropriate legal backing.

460. The ESP, Revised 2010 has taken on board MTDPF strategies for environmental sanitation especially the acquisition of sites for final disposal. To support this, a comprehensive framework will be developed to facilitate the acquisition of land for final disposal covering site assessment, valuation, negotiation and payment of compensation.

461. Laws will be enacted to operationalise the benchmarks and targets related to the 4Rs waste hierarchy, especially for industrial and commercial generators.

462. Enforcement of regulations and bye-laws are currently not effective due to inadequate capacity of sector staff and also lack of mechanisms that effectively aid "self- policing" by households and communities. To contribute to the abatement of pollution of wetlands and watercourses from point and non-point sources, a collation of all related regulations and means of enforcement in addition to the traditional "saman saman" shall be carried out. The enforcement mechanisms assessed to be potentially effective shall be implemented in the short, medium and long-term and updated regularly.

463. In the *medium term*, in support of enforcement of environmental regulations the existing process of building and development permitting by MMDAs will be updated to include the relevant sections of Environmental Assessment Regulations, 1999 (LI1652). Dissemination of these updated processes will be carried out as part of environmental sanitation education.

464. To improve the administration and prosecution of environmental sanitation offences, the Judicial Service will be supported to train members of the bench on relevant legislation. In the *long-term* it is expected that *Environmental Courts* will be established as part of MMDA courts to deal with environmental sanitation cases.

465. To ensure consistency in the application of environmental sanitation bye-laws country-wide, model bye-laws shall be disseminated to all MMDAs.

466. To safeguard groundwater sources, existing bye-laws on siting of household, communal and public treatment and disposal facilities will be widely disseminated and enforced.

467. Enhancing the quality of our beaches as part of promoting tourism will be pursued through dissemination and enforcement of relevant laws for the protection of beaches and prevention of marine pollution. Involving local communities living along beaches will be an essential element of this strategy.

468. Many of the consequences of poor environmental sanitation are not confined to national boundaries, and therefore there is the need to enhance the implementation of international accented measures and practices such as dealing with global warming, the growing menace of e-waste and management of mercury from energy-saving bulbs. Also implicated is the need to ensure that toxic and hazardous wastes are not "exported" or "imported" into Ghana through dissemination of relevant provisions.

469. Specifically, appropriate legislation is required to mandate environmental health officers in destination inspections of goods at all entry points along with other statutory

organizations such as Customs, Standards Board, and the Food and Drugs Board to ensure that Ghana is not used as a dumping ground for wastes.

4.6.4 Sustainable Financing and Cost Recovery

470. Effective implementation of the NESSAP will depend on sustainable financing arrangements of the plans and programmes that will be derived from it. To achieve this, a Strategic Environmental Sanitation Investment Plan (SESIP) has been developed to provide the required financing framework. Government will provide funding from the Consolidated Fund.

471. All economic development activities have direct impacts on the state of environmental sanitation. However, MMDAs are currently facing enormous challenges in financing the existing poor levels of services. It is therefore essential that mechanisms are developed to source funds from all sectors of the economy to remedy the situation and begin a programme of gradual improvements in levels and standards of services that matches economic growth towards a middle-income status by 2020.

472. The measures and actions as well as the corresponding time-frame proposed for achieving the policy objectives of the Sustainable Financing focus area are presented in Table 4.4. The key strategies related to the proposed measures and actions follow.

Table 4.4: Focus Area: D Sustainable Financing and Cost Recovery						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
D1- To ensure sustainable financing of environmental sanitation services	MMDAs shall establish MMDA-level Environmental Sanitation Fund and actively implement systems to generate sustainable revenue to cover the costs of services	MMDAs	MLGRD/EHSD/MoFEP	2011		
D2- To develop a strategy and financing plan with clear allocation of resources (and costs) for households, communities, MMDAs and central government	Use "polluter- pays" mechanism in determining levels of charges and fees for environmental sanitation services (gradually increase)	MLGRD	EPA/MoTI/MoFEP			2010 –2024
	Ensure "fair play" practices in the promotion of investments by all sector actors; private-private and private-public ventures	MLGRD	MoTI/MoFEP	2010		
	Identify and implement options for generating sustainable revenue to support environmental sanitation such as levies on producers and importers of pollutants especially plastics	MLGRD	MoTI/MoFEP/EPA	2010 – 2012		
	MMDAs shall establish separate budget lines for the components of environmental sanitation services and manage revenues for such services separately and exclusively for expenditure directly related to these services	MoFEP	MLGRD/MMDAs/ CAGD	2010 – 2012		
	MMDAs shall identify additional sources of revenue for sustaining environmental sanitation including rates, fees, water-surtax etc.	MMDAs	MLGRD/MoFEP	2010		
	Develop a Strategic Environmental Sanitation Investment Plan (SESIP)	MLGRD	MoFEP	2010		
	Implement a Strategic Environmental Sanitation Investment Plan (SESIP)	MLGRD	MoFEP	2010 – 2015		
D3- To improve public sector financing of environmental sanitation services	Government shall progressively increase its portion of public sector funding through greater budgetary allocations to DACF-targeted environmental sanitation services	MoFEP	MLGRD	2010 – 2015		
	Establish a National Environmental Sanitation Improvement Fund to be sourced from existing and planned sector funds for financing the SESIP	MLGRD	MoFEP	2010		
Specific Component Measures: Solid Waste Management						
D1- To ensure sustainable financing of environmental	Apply direct cost recovery from all users as far as possible covering all operating and capital	MLGRD	MoFEP			2010 -2024

Table 4.4: Focus Area: D Sustainable Financing and Cost Recovery						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
sanitation services	costs, for services such as liquid and solid waste collection, public toilets, issuance of permits etc					
	MMDAs shall set tariffs with full participation of private sector service providers and users (to be revised once a year)	MMDAs	PRIVATE OPERATORS/ USER-GROUPS			2010 -2024
	MMDAs shall implement differential tariffs to ensure overall cost recovery	MMDAs	MLGRD/MoFEP			2010 -2024
D2- To develop a strategy and financing plan with clear allocation of resources (and costs) for households, communities, MMDAs and central government	Identify options for generating sustainable revenue to support environmental sanitation such as levies on producers and importers of pollutants especially plastics	MLGRD	MMDAs/MoFEP	2010		
	Implement options for generating sustainable revenue to support environmental sanitation such as levies on producers and importers of pollutants especially plastics (revise once a year)	MLGRD	MMDAs/MoFEP			2011 -2024
Specific Component Measures: Excreta Management						
D1- To ensure sustainable financing of environmental sanitation services	Apply direct cost recovery from all users as far as possible covering all operating and capital costs, for services such as liquid and solid waste collection, public toilets, issuance of permits etc	MMDAs	MLGRD/MoFEP			2010 -2024
	MMDAs shall set tariffs with full participation of private sector service providers and users (to be revised once a year)	MMDAs	PRIVATE OPERATORS/USER-GROUPS			2010 -2024
	MMDAs shall implement differential tariffs to ensure overall cost recovery	MMDAs	MLGRD/MoFEP			2010 -2024
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
D1- To ensure sustainable financing of environmental sanitation services	Apply direct cost recovery from all users as far as possible covering all aspects of issuance of permits and for maintenance management of drains	MMDAs	MLGRD/MoFEP	2011		
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
D1- To ensure sustainable financing of environmental sanitation services	Apply direct cost recovery from all users as far as possible covering all operating and capital costs, for services such as liquid and solid waste	MLGRD	EHSD/MMDAs			2011 -2024

Table 4.4: Focus Area: D Sustainable Financing and Cost Recovery						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
	collection, public toilets, issuance of permits etc					
D2- To develop a strategy and financing plan with clear allocation of resources (and costs) for households, communities, MMDAs and central government	Use "polluter- pays" mechanism in determining levels of charges and fees for environmental sanitation services (gradually increase)	MLGRD	EPA/MoTI/MoFEP			2010 -2024
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
D2- To develop a strategy and financing plan with clear allocation of resources (and costs) for households, communities, MMDAs and central government	Use "polluter- pays" mechanism in determining levels of charges and fees for environmental sanitation services (gradually increase)	MLGRD	MoH/ EPA/MoTI/MoFEP	2010		

473. In the *short-term*, injection of capital by the private sector in improving services including provision of public toilets, refuse collection and cesspit-emptying vehicles, and construction of treatment and disposal facilities will be facilitated in a transparent manner with appropriate incentives that gives investor-confidence.

474. While funds provided from Central Government (e.g. DACF) for supporting the five largest cities have been labeled as "Special Sanitation Funds" (SSF), the ultimate aim is for each MMDA to establish and operate a dedicated and "ring-fenced" Environmental Sanitation Fund. All sources of funds to be identified in the SESIP including funds for specific projects shall be lodged into these funds. In addition all MMDAs shall identify other sources of revenue for sustaining environmental sanitation services including rates, special fees and fines.

475. As a rule the "polluter-pays-principle" will be applied in determining levies, fees and fines, adequate for meeting the costs of services. As a transitional measure to operating the dedicated fund MMDAs shall be required to establish separate budget lines for the components of services and manage revenues for such services separately. This is to enable determination of the capacity to provide sustainable operation and maintenance management of services as well as replacement of facilities.

476. Once the SESIP becomes operational and, the national and MMDA funds are in place these will provide the needed financing over the medium- to long-term period for the NESSAP. Government will progressively increase its share of allocations of the DACF targeted to environmental sanitation. As part of medium-term strategic planning, government will commence from 2010 the provision of budget dedicated to implementing the NESSAP.

477. In order to ensure sustainable financing of services and gradually improve levels of services, direct cost-recovery shall be applied. In applying this principle consideration will be given to affordability, differential tariffs and cross-subsidisation where appropriate. As part of this arrangement MMDAs shall establish participatory procedures for setting tariffs involving private sector operators and user-groups.

478. To provide a sustainable means of managing the increase in plastic content of the waste stream and littering including recycling, specific levies shall be applied on importers and producers of plastic products. MMDAs shall also apply levies on distributors and users of plastic products.

479. Best practices from the novel MOTI/AMA programme of managing littering by sachet-water producers, vendors and users will be replicated in Central-Business-Districts (CBD) of district-capitals country-wide.

480. The responsibility for provision of cleansing and maintenance of primary, secondary (including road-side) drains has traditionally been divided among a number of institutions. Although MMDAs are legally responsible for this service the MWRWH (through the Hydrological Services Division) has been responsible for awarding contracts for desilting of drains while the DUR has been providing same for road-side drains. The high labour- intensive and costs associated with drain cleansing and maintenance has often led to inadequate budget allocation by MMDAs. Furthermore without expertise and dedicated technical units for the service it is often neglected. As part of efforts to remedy this, the five largest cities are creating Drainage Maintenance Units and preparing drain maintenance plans. The preparation of plans will go a long way to ensure targeting of scarce funds at priority drainage maintenance activities while additional funds will be mobilised for the involvement of communities through CBOs. This will be replicated for all MMDAs. In smaller DAs the Environmental Health and Management Departments will continue to be responsible for drain cleansing.

481. A sustainable means of preventing the common ailments such as cholera, typhoid, dysentery and malaria is to focus more on prevention than hitherto. The application of direct costs of services to be borne by users requires that adequate information on the costs incident on each of the services is made available. Educating the public on food-safety and hygiene and the implications of poor drain maintenance and refuse collection on malaria, and the costs to the economy will, as an example, justify applying funds from non-traditional sources such as Talk-tax.

482. A basic aim of applying the "polluter-pays-principle" is to identify the costs due to various components and sources of the waste stream. While recycling is voluntarily being practiced, the level and extent is currently low. The detail characterisation of waste will improve information on sources of waste sector-by-sector and thus influence, for example, targets to be set for recycling of more waste from industry and service sectors.

483. All taken together the ultimate aim is to decouple the growth in wastes and therefore improve the "green-economy" component due to expected total economic growth of Ghana. Figures 4.1 to 4.4 show the value-chain maps for the four (4) main components of the solid waste stream analysed as part of a study on the potential for job creation targeting the youth[32].

4.6.5 Levels of Service

484. The main objective of the NESSAP is to provide a basis for gradual and incremental improvement in the levels of service for different target groups. The choice of any level of service by any segment of the population should be based on informed demand. For the first time in Ghana, a comprehensive baseline survey has being carried out as part of the preparation of District-level Environmental Sanitation Strategies and Action Plans (DESSAPs). The data gathered informs this final version of the NESSAP.

485. The measures and actions as well as the corresponding time-frame proposed for achieving the policy objectives of the Levels of Service focus area are presented in Table 4.5. The key strategies related to the proposed measures and actions follow.

486. An important cornerstone of refining the NESSAP is the completion of DESSAPs by MMDAs. From the third quarter of 2007, MMDAs were engaged in the collection of data on existing levels of environmental sanitation infrastructure and services towards the preparation of DESSAPs. The collated baseline information on environmental sanitation show the existing levels of service in various categories of urban and rural towns and districts, and the access to these services by households in the different housing segments.

487. The defined levels of service ranging from existing "unacceptable" to "minimum" to "comfortable" and to the ultimate "amenity" will be used as a basis for establishing the existing, the projected gaps and thus the incremental improvements required in infrastructure and services.

488. It is expected that, in the *medium-* to *long-term* and in line with guidelines from the National Development Planning Commission (NDPC), MMDAs shall update their DESSAPs to meet the District Medium-Term Development Planning cycle.

489. In the ***short-term***, Districts will incorporate their DESSAPs in the next MTDPs to come into force in 2010. The first round of DESSAPs will target achieving "minimum" levels of service by the end of 2015.

[32] Value-Chain Analysis of SWM in Accra for CHF-Ghana YES Programme. WasteCare Associates, March 2010.

490. In order to meet the demands of all segments of society, the levels of service to be adopted will make provision for the needs of the vulnerable groups: women, children and the poor, especially people with disability. In locating treatment and disposal facilities, strict adherence to planning guidelines, EPA guidelines and other relevant regulations will be maintained.

Figure 4.1: Value Chain Map - Compost

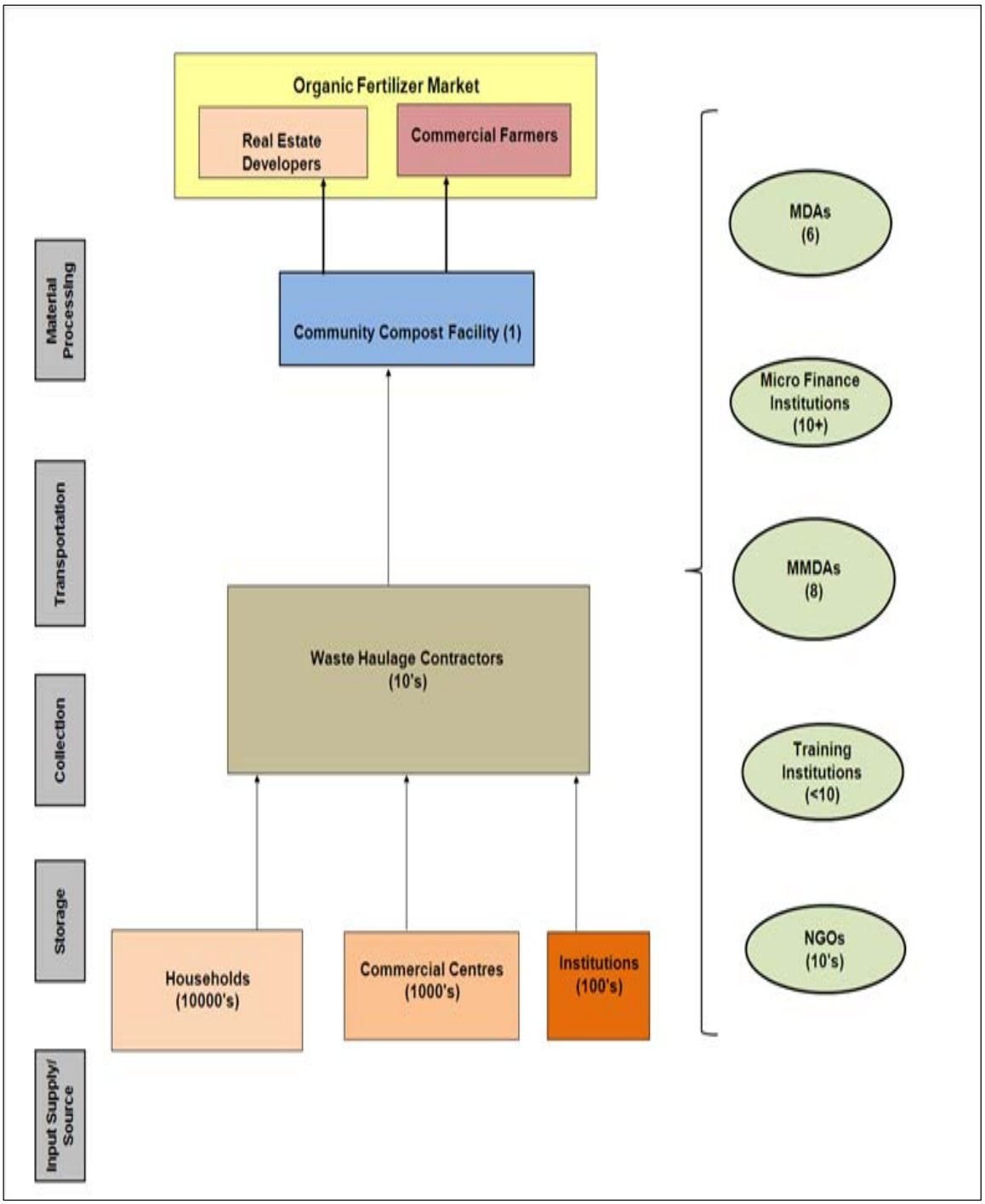


Figure 4.2: Value Chain Map- Thin Film Plastics

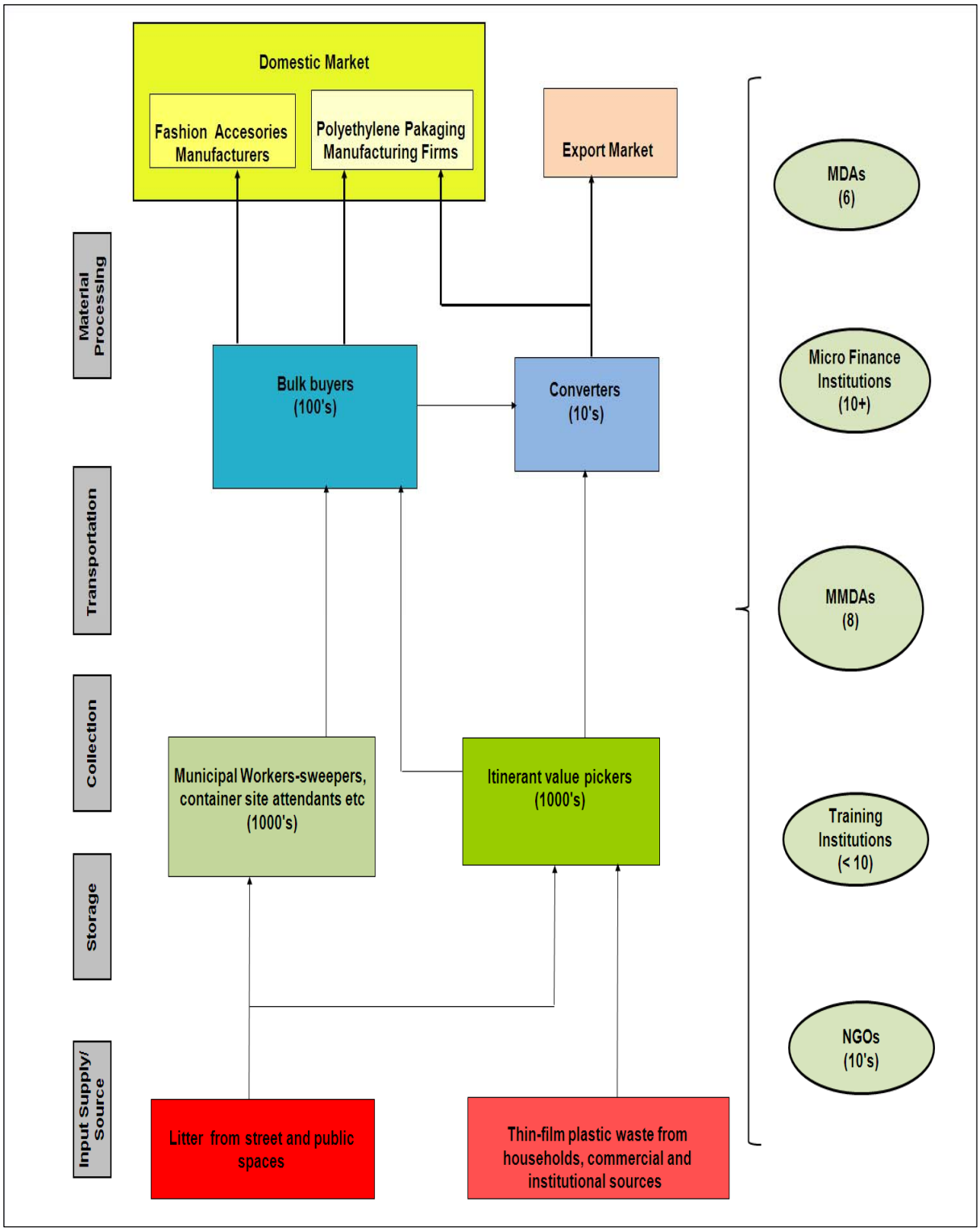


Figure 4.3: Value Chain Map- Ferrous Metals

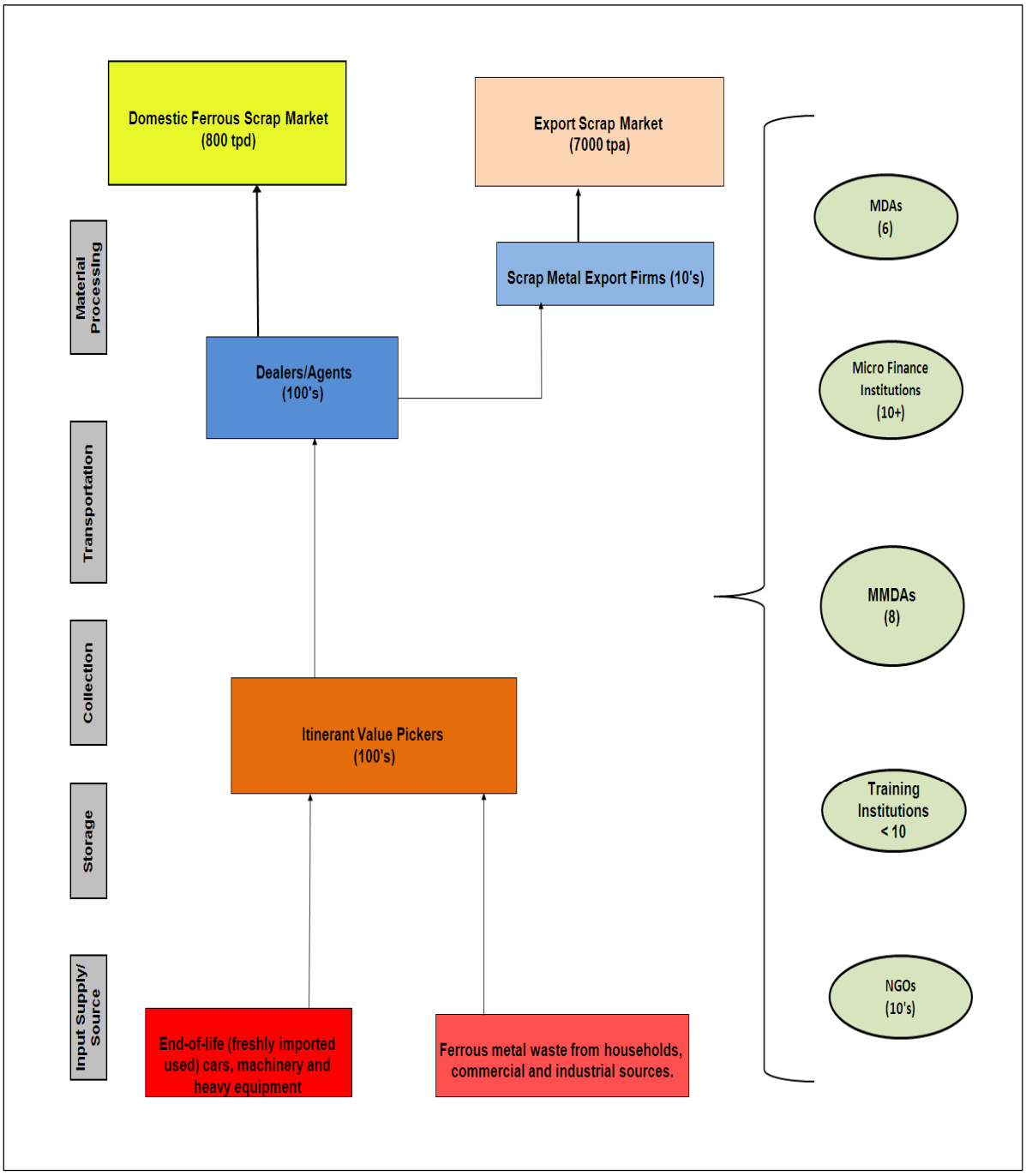


Figure 4.4: Value Chain Map, E-Waste

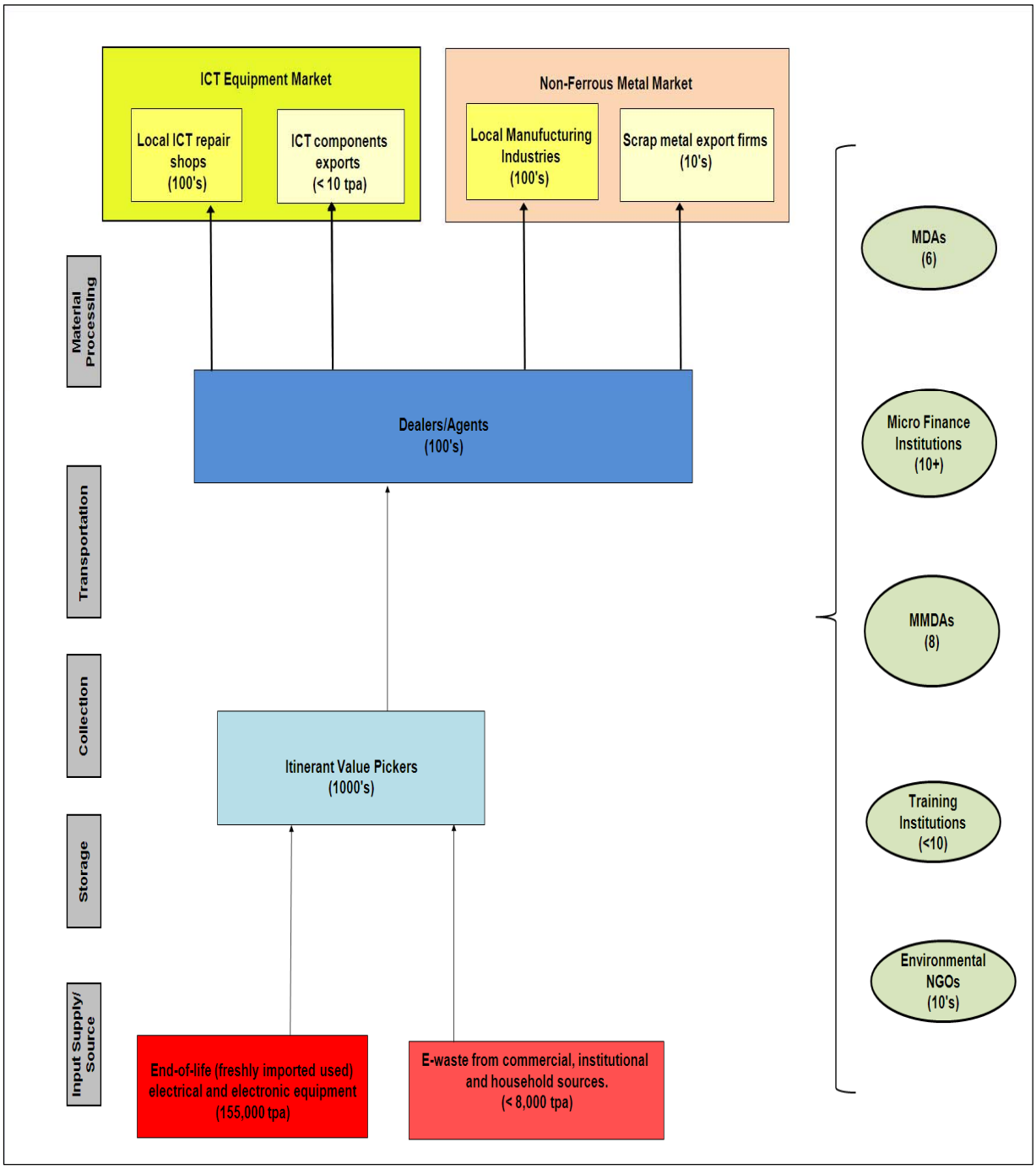


Table 4.5: Focus Area: E Levels of Service						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
E1- To effectively contain and decrease the negative impact from poor environmental sanitation	All MMDAs shall prepare District Environmental Strategy and Action Plans (DESSAPs)	MMDAs	MLGRD/EHSD	2010		
	All MMDAs shall update District Environmental Strategy and Action Plans (DESSAPs) every 4 year in line with MTDP datelines	MMDAs	MLGRD/EHSD			2013 –2024
	MLGRD shall prepare a National Environmental Sanitation Strategy and Action Plan (NESSAP) based on DESSAPs	MLGRD	EHSD	2010		
	MLGRD shall update the National Environmental Sanitation Strategy and Action Plan (NESSAP) based on DESSAPs every 4 years	MLGRD	EHSD	2013		
E3- To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles	Develop and ensure provision of programme for incremental coverage of, and access to services to meet increasing population and growing economy	MLGRD	MMDAs	2010		
Specific Component Measures: Solid Waste Management						
E1- To effectively contain and decrease the negative impact from poor environmental sanitation	Ensure that the bulk of environmental sanitation services shall be provided by the private sector under regulation by the public sector agencies	MLGRD	MMDAs			2009 –2024
	MMDAs shall maintain adequate capacity to intervene and provide the services in the event of failure of the private sector to deliver services due to industrial actions in their establishments or other reasons	MMDAs	EHSD			2009 –2024
	Ensure that services meet the needs of specific target groups including vulnerable people, women and children, and the poor	MMDAs	EHSD			2009 –2024
	Ensure that sites for treatment and disposal of wastes (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) are located so as not to create safety and health hazards or aesthetic problems in the surrounding area	MMDAs	EPA			2011 –2024
E2- To support adequate treatment and final disposal of all wastes	Ensure that development and sitting of communal storage and transfer depots, treatment and disposal facilities conform to statutory land-use norms and regulations	MMDAs	MLGRD/TCPD			2009 –2024
	Ensure acquisition of appropriate sites for treatment and disposal facilities (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) using participatory principles including SEA	MMDAs	MLGRD/EPA			2009 –2024
	Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards including the preparation of Environmental Impact Assessments	MMDAs	MLGRD/EPA			2008 –2024

Table 4.5 Focus Area: E Levels of Service						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
E3- To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles	Provide services and facilities for primary separation of solid wastes at household, community, public levels and commercial areas •20% by 2013 •25% by 2015 •70% by 2025 •90% by 2035	MMDAs	EPA			2012 –2024
E4- To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste	Identify all environmentally sensitive areas such as wetlands and water courses prone to impact from waste-abuse	EPA	MLF&M	2010		
	Provide adequate targeted services in areas close to wetlands, water courses and other vulnerable water resources prone to waste-abuse	MMDAs	MLGRD/MWRWH-WRC	2010		
E5- To meet the needs of vulnerable and physically challenged individuals in provision of services	Develop mechanisms for integrating the activities of 'scavengers' in improved waste collection, transfer, treatment and disposal facilities	MMDAs	MEST/MoFEP/ MLGRD	2010		
Specific Component Measures: Excreta Management						
E1- To effectively contain and decrease the negative impact from poor environmental sanitation	Ensure that the bulk of environmental sanitation services shall be provided by the private sector under regulation by the public sector agencies	MLGRD	MMDAs		2009 –2020	
	MMDAs shall maintain adequate capacity to intervene and provide the services in the event of failure of the private sector to deliver services due to industrial actions in their establishments or other reasons	MMDAs	EHSD			2009 –2024
	Ensure that services meet the needs of specific target groups including vulnerable people, women and children and the poor	MMDAs	EHSD			2009 –2024
	Ensure that sites for treatment and disposal of wastes (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) are located so as not to create safety and health hazards or aesthetic problems in the surrounding area	MMDAs	EPA			2009 –2024
E2- To support adequate treatment and final disposal of all wastes	Ensure that development and sitting of communal storage and transfer depots, treatment and disposal facilities conform to statutory land-use norms and regulations	MMDAs	MLGRD/TCPD			2008 –2024
	Ensure acquisition of appropriate sites for treatment and disposal facilities (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) using participatory principles including SEA	MMDAs	MLGRD/EPA			2009 –2024
	Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards including the preparation of Environmental Impact Assessments	MMDAs	MLGRD/EPA			2010 –2024

Table 4.5 Focus Area: E Levels of Service						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
E3- To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles	Ensure adequate systems for managing wastewater treatment, re-use and disposal	MMDAs	MLGRD/EHSD			2010 -2024
E4- To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste	Identify all environmentally sensitive areas such as wetlands and water courses prone to impact from waste-abuse	EPA	MLNR	2011		
	Provide adequate targeted services in areas close to wetlands, water courses and other vulnerable water resources prone to waste-abuse	MMDAs	MLGRD/MWRWH-WRC	2011		
E5- To meet the needs of vulnerable and physically challenged individuals in provision of services	Ensure adequate options of facilities are available for all segments of the population especially vulnerable and physically challenged persons	MMDAs	MoWAC/MoH			
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
E3- To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles	Ensure adequate systems for managing storm water drainage and sullage conveyance • Develop Drainage Development Plans (DDPs) for all Regional Capitals by 2012 •Develop DDPs for all District Capitals by 2015 •Implement First-round sub-projects of DDPs beginning 2011	MMDAs	MLGRD/EHSD	2011 – 2015		2009 –2024
E4- To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste	•Identify all environmentally sensitive areas such as wetlands and water courses prone to impact from waste-abuse	EPA	MLNR	2011		
	•Provide adequate targeted services in areas close to wetlands, water courses and other vulnerable water resources prone to waste-abuse	MMDAs	MLGRD/MWRWH-WRC	2011		
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
E1- To effectively contain and decrease the negative impact from poor environmental sanitation	•Ensure that all environmental services at all levels meet minimum prescribed sector standards	MMDAs	MLGRD/EPA/ MoH/Private Operators			2010 –2024
	•Ensure that various levels of service meet the health needs of people and the environment and are consistent with related services such as water, energy, transport etc.	MMDAs	MLGRD/EPA/ MoH/TCPD/ NESPoCC			2010 –2024

Table 4.5 Focus Area: E Levels of Service						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
E1- To effectively contain and decrease the negative impact from poor environmental sanitation	Ensure that sites for treatment and disposal of wastes (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) are located so as not to create safety and health hazards or aesthetic problems in the surrounding area	MMDAs	EPA/TCPD/WRC	2011 – 2015		
E2- To support adequate treatment and final disposal of all wastes	•Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards including the preparation of Environmental Impact Assessments	MMDAs	MLGRD/EPA/ TCPD			2011 –2024
	•Ensure that facilities are managed so as to satisfy approved environmental protection standards	MMDAs	EPA			2011 –2024
E4- To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste	Ensure that DESSAPs address issues of pollution of water resources	MMDAs	MLGRD/EPA/ WRC	2010		
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
E4- To support remedial strategies for all wetlands and water courses under threat from indiscriminate disposal of waste	•Ensure implementation and operation of proper Health-care waste management systems and facilities •Full compliance by 100% Regional and Specialist Hospitals with guidelines by 2013 •Full Compliance by 50% District Hospitals by 2015 •Full Compliance by 100% District Hospitals by 2025 •Full compliance by 25% all other health-care facilities by 2025		MoH/EPA/ MLGRD	2011 – 2015		
	Ensure (and monitor) that industries establish and operate proper facilities/systems for hazardous wastes		MLGRD/EPA/ MoTI	2010 – 2015		

491. To prevent further pollution from indiscriminate disposal and discharges of wastes and implement remedial actions to safeguard wetlands and water sources an inventory of all such areas will be made and appropriate services implemented. In all cases, the provision of adequate treatment and disposal facilities to meet the required levels of services will be pursued. As stated in earlier sections, participatory tools, such as SEA that broadens participation to include non-experts, will be used to ensure effective stakeholder involvement in the selection of appropriate low-cost technologies for all types of services.

492. In the ***medium-term***, it is expected that the involvement of the private sector will bring innovation and improve levels of service beyond "minimum" levels. In order to deliver services to the required standards, MMDAs shall maintain capacity where appropriate, including accessing support from the private sector. MMDAs shall also regulate and assess the performance and be able to intervene and restore services promptly in the event of breakdown of services by private operators.

493. In order to operationalise a number of strategies for reducing the amount of wastes ending up at final disposal sites (e.g. *reduction, re-use, recycling and recovery*) in the country and therefore check the expected increase in waste volumes due to anticipated middle-income status, a vigorous programme of separation at primary and, where appropriate, secondary levels of collection shall be pursued. By the end of the first round of implementation of DESSAPs, it is projected that 15% of solid waste from household, communal, public, commercial and industrial sources shall be separated at source.

494. Specific to the collection, transport and disposal of *solid waste* it is important that the role and special needs of waste-value pickers (referred to wrongly as "scavengers" and "bola boys") in the chain, especially at final disposal sites, are recognised and addressed. In the short- to medium-term, the potential for integrating recycling stations at disposal and communal storage (skip depots) operated by waste-value pickers will be examined. The extension of the Waste Management module under the National Youth Employment Programme (NYEP) to cover management of communal transfer stations will also be explored.

495. Concerning *excreta management*, the haulage and transport of septage and faecal sludge, and provision of public facilities in Ghana's five largest cities are mainly by the private sector. The franchise management of public toilets and the provision of cesspit emptier services by private operators will be extended to all Districts within the medium-term. The private sector is expected to innovate in meeting the needs of the vulnerable especially the use of public facilities by physically challenged persons.

496. Providing appropriate low-cost treatment and disposal facilities for septage and faecal sludge impacts greatly on the levels of service for excreta management, particularly the efficient management of communal and public facilities. It also impacts on pollution due to "cow-boy" discharging of emptier trucks into streams and watercourses. To ensure safe handling of septage and faecal sludge MMDAs will install Faecal Sludge Treatment Plants (FSTPs), waste stabilisation ponds and bio-digesters.

497. Guidelines on all aspects of the services and facilities for excreta management shall be updated where they exist, and new ones prepared where they are not available, and disseminated to all levels, especially sub-metropolitan districts, zonal, town and area councils.

498. In the short- to medium-terms drainage development plans shall be prepared for all regional and district capitals for effective management of *storm drainage and sullage conveyance*. It is expected that within the medium term drainage interventions as is been carried out in the five largest cities will be extended to cover priority works in

other regional and district capitals. It is also expected that the preparation of DESSAPs will provide the priority elements of Drainage Development Plans and the required maintenance management arrangements.

499. To enable households and users of services make informed choices and decisions on levels of service and related technologies, affordability and willingness to pay for and maintain the services, *environmental sanitation education and enforcement* will entail the provision of adequate information on costs and benefits on all services. In addition information on the legal and sanction regimes to support the effective implementation of the desired levels of service will be provided.

500. All MMDAs shall integrate into their DESSAPs, existing management plans being implemented by the MoH regarding *healthcare waste*. The guidelines on Health-Care Waste prepared by the MoH will be used to assess the levels of service provided for handling (including storage, collection, transport, treatment and disposal) of clinical wastes and the required improvements to be made and programmes to be implemented by the specific health-care institutions.

501. The characterisation of wastes by industries and the implementation of the hierarchy of waste management options will be closely monitored and a system of reporting on performance implemented within the medium term.

4.6.6 Research and Development

502. The challenges posed by diverse waste streams resulting from lifestyle changes associated with a growing and modernising economy require that Research and Development (R & D) remains a focal element of the Environmental Sanitation Policy (Revised, 2009). On-going R & D would ensure that appropriate infrastructure and services are suitably provided as needed.

503. The ultimate aim is to improve the knowledge of sector practitioners on the sources of wastes, costs to the economy due to management of the various components and actions that will stimulate *MINTing* to improve the "green economy" so that growth in net waste does not necessarily follow the growth pattern of the total economy.

504. The measures and actions as well as the corresponding time-frame proposed for achieving the policy objectives of the Research and Development focus area are presented in Table 4.6. The key strategies related to the proposed measures and actions follow.

Table 4.6: Focus Area: F- Research and Development						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
F1- To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels	Support the development of platform for transparent and credible assessment and reporting of sector performance	MLGRD	EHSD/EPA/IFAWAMI/CONIWAS	2009		
	Continue to strengthen and support the Schools of Hygiene, Institute of Local Government Studies (ILGS), University departments to provide accurate and regular data on environmental sanitation	MLGRD	EHSD/MoE-GETFUND			2009 –2024
F2- To support research in appropriate technologies to meet the needs of all segments of society, especially vulnerable and poor people	Carry out assessments to determine effective demand of communities (urban, peri-urban, small towns and rural) for environmental infrastructure	MLGRD	EHSD/TCPD			2008 –2024
	Support studies on alternative technology options for improving services to low-income urban areas, small towns and rural areas	MLGRD	KNUST/CSIR/Private Sector	2011		
F3- To respond effectively to increasing waste volumes and changing waste streams due to growing economy and varying life-styles	Ensure that relevant agencies, at all levels, provide timely and reliable data and information for tracking sector progress for national development planning	MLGRD	NDPC/EHSD/ NESPoCC/GSS			2009 –2024
Specific Component Measures: Solid Waste Management						
F1- To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels	Develop framework for tracking the volumes and types of waste streams generated from all segments of the economy	MMDAs	EHSD/CSIR/MoE	2009		
	Examine and assess the capabilities of existing research and service institutions and provide appropriate support for research on environmental sanitation	MLGRD	EHSD/MoE	2011 – 2015		
F2- To support research in appropriate technologies to meet the needs of all segments of society, especially vulnerable and poor people	Support local private sector entrepreneurs and artisanal entities to produce machines, equipment and tools appropriate for local use	MLGRD	MoFEP	2011 – 2015		
F3- To respond effectively to	Support research and studies in volumes and types of waste from predominant sectors and	MLGRD	MoE/MoFEP	2010 – 2011		

Table 4.6: Focus Area: F- Research and Development						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
increasing waste volumes and changing waste streams due to growing economy and varying life-styles	segments of the economy (especially sources of non-biodegradable-organic-fractions, special and hazardous wastes)					
	Support research in handling and alternative uses of existing and changing composition of waste streams	MLGRD	MoE/CSIR/MoFEP	2009 – 2015		
	Support research in identifying fractions of waste streams with appropriate thermal values for waste-to-energy systems	MLGRD	MoE/MoFEP	2015		
Specific Component Measures: Excreta Management						
F1- To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels	Examine and assess the capabilities of existing research and service institutions and provide appropriate support for research on environmental sanitation	MLGRD	MoE/ILGS	2010 – 2015		
	Develop framework for tracking the volumes and types of waste streams generated from all segments of the economy	MLGRD	EHSD/CSIR/ PRIVATE SECTOR	2011		
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
F1- To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels	Ensure effective dissemination of results of operational research and studies on waste stream composition and volumes from research institutions	MLGRD	RESEARCH INSTITUTIONS/ MMDAs	2009 – 2015		
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
F1- To develop an effective framework for capturing, reporting of sector statistics and performance to users at all levels	Develop framework for tracking the volumes and types of waste streams generated from all segments of the economy	MLGRD	MMDAs/MoH/ MoTI /AGI	2011		
	Examine and assess the capabilities of existing research and service institutions and provide appropriate support for research on environmental sanitation	MLGRD	EHSD/MoE	2010 – 2015		

505. The ***short term*** strategy for R & D would focus on data gathering and assessments to determine the nature and types and volumes of wastes generated from various sectors of the economy nation-wide and to establish the demand for the various infrastructure and services. For this purpose, a framework for tracking the various waste streams would be developed. This would also require support for the development of platforms and/or strengthening existing ones for transparent and credible assessment and reporting of sector performance. In this regard, the relevant institutions such as the Schools of Hygiene (SoH) and the ILGS would be strengthened to support R & D institutions including CSIR and KNUST.

506. Special emphasis would be placed on the characterisation of wastes from industrial and commercial sources, especially non-biodegradable-organic-fractions, special and hazardous wastes.

507. In the ***medium to long term***, assessment of the capabilities of the various research and service institutions would be carried out with the aim of providing them appropriate support for research on environmental sanitation.

508. During this phase, specific R & D for *solid waste management* would focus on supporting local private sector entrepreneurs and artisanal entities to produce machines, equipment and tools appropriate for local use. Furthermore, support would be given to research in handling and alternative uses of existing and changing composition of waste streams including research in identifying fractions of waste streams with appropriate thermal values for waste-to-energy options.

509. At the same time, *education and enforcement management* component would pay attention to identifying effective means of disseminating results of operational research and studies on waste stream composition and volumes from research institutions, including the use of traditional authorities.

4.6.7 Monitoring and Evaluation

510. The Environmental Sanitation Policy (Revised, 2009) incorporates Monitoring and Evaluation as a key focal area for improving environmental sanitation services. Regular monitoring and evaluation carried out at all levels involving innovative participatory approaches would ensure that infrastructure and services are maintained at the optimum possible levels.

511. Considering the current poor levels of infrastructure and services, the capability to appraise and inform on the incremental improvements made is essential to assure all of "value-for-money" in interventions, especially where direct payment by users is required for operation and maintenance of facilities.

512. The measures and actions as well as the corresponding time-frame proposed for achieving the policy objectives of the Monitoring and Evaluation focus area are presented in Table 4.7. The key strategies related to the proposed measures and actions follow.

Table 4.7: Focus Area: G - Monitoring and Evaluation						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
G1- To develop framework for monitoring and evaluation at all levels within the sector	Assess how existing M&E platforms can integrate environmental sanitation	MLGRD	NDPC/MMDAs	2011		
	Develop appropriate indicators for each of the policy focus areas	MLGRD	EHSD/NESPoCC	2008		
	Institute procedures for carrying out participatory M&E at all levels	MLGRD	EHSD/NESPoCC	2011		
	Monitor and evaluate the performance of facilities and services and institute remedial measures where required	MLGRD	EHSD/NDPC			2011 –2024
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all levels	MLGRD	MMDAs	2010		
	Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	MLGRD	MMDAs/NDPC	2010 – 2012		
G3- To develop a responsive reporting and feedback mechanism for M&E	Define appropriate strategy for communicating information on M&E in collaboration with other allied institutions	MLGRD	MMDAs/NDPC/EPA	2011		
	Ensure that relevant agencies, at all levels, provide timely and reliable data and information for tracking sector progress and contributing to periodic sector updates (MTDPF-APR, JMP, GLAAS)	MLGRD	EHSD/NESPoCC	2010 – 2015		
Specific Component Measures: Solid Waste Management						
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all levels	MLGRD	EHSD/NESPoCC/MoI			2010 -2024
	Establish/strengthen structures for effective M&E including mechanisms for DA-					

Table 4.7: Focus Area: G - Monitoring and Evaluation						
General Measures						
Obj No.	**Measure**	**Responsibility**		**Time Frame**		
		Lead Agency	**Support Agencies**	**2010-2015**	**2016-2020**	**2020-2025**
	and community-level monitoring					
Specific Component Measures: Excreta Management						
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all levels Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	MLGRD	EHSD/NESPoCC/MoI			2010 -2024
Specific Component Measures: Storm Water Drainage and Sullage Conveyance						
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all levels Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	MLGRD	EHSD/NESPoCC			2010 -2024
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)						
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all level Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	MLGRD	MoJ&AGD/EHSD/ NESPoCC/MoI			2010 -2024
Specific Component Measures: Health-care, Industrial and Hazardous Wastes						
G2- To strengthen capacity to implement M&E	Assess capacity for implementing M&E at all level Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	MLGRD	EHSD/NESPoCC/ MoI /MoTI			2010 -2024

513. The foundations for implementing an effective M & E system would be established in the ***short term*** as part of the pre-implementation arrangements. This would involve assessing the relevant capacity needs at all levels for effective M & E. In addition, all existing M & E e-platforms including ***Ghanainfo*** of the Ghana Statistical Service and ***Planinfo*** of NDPC**,** etc. would be examined to identify the access points for integrating environmental sanitation components. This would be done concurrently with the development of appropriate indicators for monitoring the various aspects of the policy implementation as well as the specific components of environmental sanitation.

514. Once the foundation has been laid, appropriate procedures would be instituted for carrying out participatory M&E at all levels including defining appropriate strategy for communicating information on M&E in collaboration with other allied institutions.

515. Up to the ***medium term***, emphasis would be placed on strengthening structures for effective M&E including mechanisms for DA- and community-level monitoring; where necessary new structures would also be established.

516. Throughout the implementation phase, it is expected that monitoring and evaluation of the performance of facilities and services and instituting remedial measures where required, would be a permanent feature into the ***long term***. To this end, efforts would be made to ensure that relevant agencies, at all levels, provide timely and reliable data and information for tracking sector progress and contributing to periodic sector updates.

517. A core strategic focus of M&E will be on how the various segments of the "green economy" are responding to policy actions and affecting the total economy. For example, the growth in "green-collar" jobs as a proportion of the total employment levels in the country will be assessed against any perceived improvements in the key sectors of the economy.

518. Civil society, NGOs and other advocacy groupings (including those involved in religious, human-rights and legal activities) will be involved in sector performance appraisals and reporting to ensure transparency and pursuit of required reforms and/or improvements. For example, the roles of the Inter-Faith Waste Management Initiative (IFAWAMI), CONIWAS and CONINWAM in sector performance appraisal and reporting at national, regional, district and community levels will be examined and appropriately supported.

519. The involvement of sub-metropolitan districts, zonal, town and area councils in M&E of all components of environmental sanitation infrastructure and services will be implemented to ensure that sub-projects and interventions emanating from DESSAPs are adequately informed by users of the services themselves.

520. At the national level the dissemination of sector performance involving traditional authorities, NGOs, religious bodies, ministries, departments and agencies under the auspices of the Ministry of Information (MoI) will be implemented to provide the necessary high-level platform for M&E reportage.

4.7 Linking National Strategies to DESSAPs

521. The above strategies and action plans for each of the focus areas and components of the Environmental Sanitation Policy (Revised, 2009), provides the initial policy-level strategies and plan targets. These will guide the preparation of DESSAPs based on the comprehensive country-wide baseline information on environmental sanitation.

522. DESSAPs provide the critical "bottom-up" feedback needed for updating the NESSAP. The NESSAP and DESSAPs provide the necessary standards and data for preparing the SESIP and hence the framework for financing environmental sanitation.

4.8 Environmental Implications of Proposed Strategies

523. The NESSAP proposes a wide range of strategies and actions under the different focus areas, aimed at addressing the many challenges facing the environmental sanitation sector. Implementing the strategies of the NESSAP has the potential of benefits as well as adverse effects on the environment that have to be accounted for.

524. The potential adverse effects are expected to arise more from the impacts of construction and operation of various facilities such as drains, Material recovery Facilities (MRFs), treatment sites etc. However, the application of SEA in the overall ESP/NESSAP development process has ensured that obvious environmental effects are considered in the strategy formulation. It is therefore expected that the overall benefits to the environment will exceed the adverse effects.

525. As required adherence to EA Regulations of 1999 (LI 1652) will ensure that EIAs for relevant interventions are carried out to ensure that appropriate mitigation is carried out. Implementation of the strategies of NESSAP is expected to improve the key environmental concerns listed under Section 2.2., and lead to improvements in the physical environment and general health of the population, particularly residents of low-income areas.

526. It is important to emphasise that improvements in environmental sanitation will go a long way to propel Ghana towards the achievement of MDG on environmental sustainability. Reducing and ultimately eliminating the widespread pollution of water bodies and wetlands caused by improper waste disposal and inadequate waste water management practices will lead to improved water quantity and quality and thereby ensure sustainable provision of water for consumption and production.

527. Improving the treatment and management of wastes on the whole will reduce carbon emissions arising from widespread indiscriminate dumping and burning of refuse which contributes to the phenomenon of climate change (global warming) with the attendant negative effects on health and livelihoods.

4.9 Implications of NESSAP Targets and MDGs

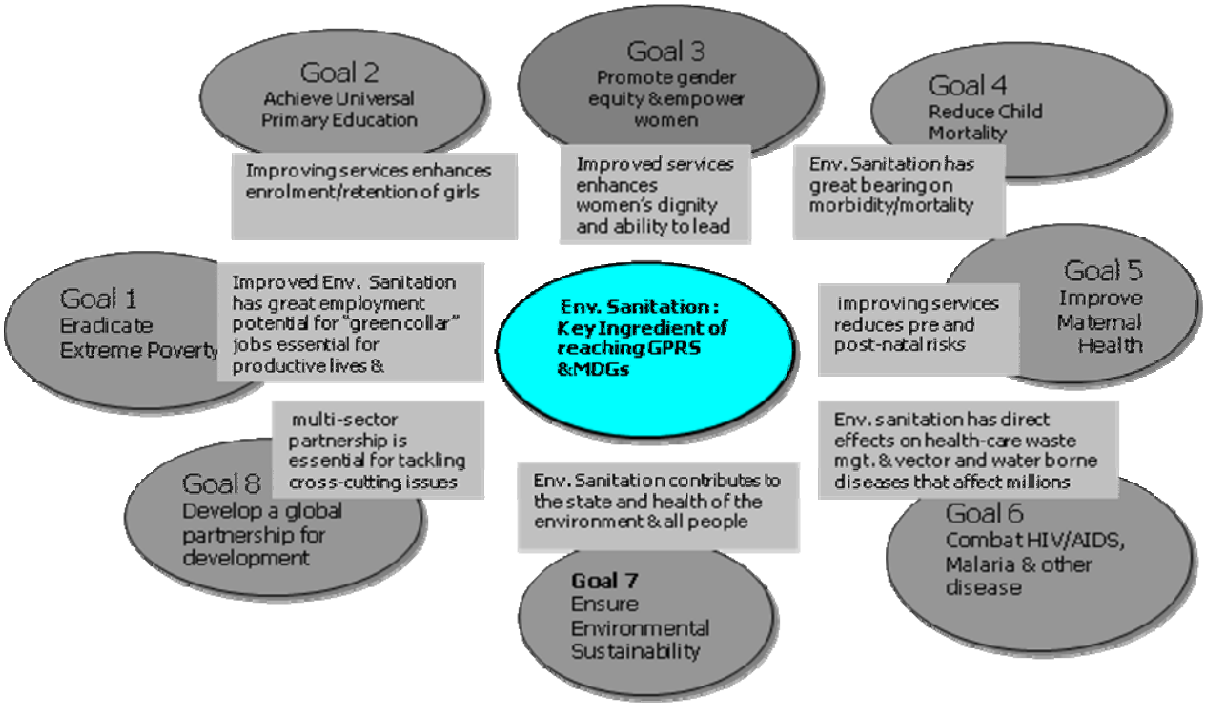
528. The strategies and targets indicated under Section 4.6, apart from the promotion of improved household sanitation facilities, are not related directly to any specific MDG target but rather considered as severally contributing to achieving aspects of the targets of all the MDGs, in particular Goal 7 (Environmental Sustainability).

529. This is demonstrated in Figure 4.5. As the various programmes of the NESSAP are tackled to cover all the components of environmental sanitation it is expected to contribute, in the process, towards achieving all the MDGs.

530. Owing to the lack of clearly stated targets for most of the components of environmental sanitation apart from excreta disposal (Goal 7, Target 7c), the relationship between NESSAP targets and other MDGs can only be partially described qualitatively and by means of proxy indicators.

531. For example, the proposed adoption of the term material-in-transition ("MINT") for all discards (instead of "waste") and the process of "minting" to derive maximum benefits along the value-chain of each component of environmental sanitation is aimed at identifying all the potential sector "value-chain" enterprises to provide more "green collar" jobs. This is directly related to MDG Goal 1 "Eradicate Extreme Poverty"

Figure 4.5: The Link between Environmental Sanitation and MDGs


Goal 2
Achieve Universal Primary Education
Goal 3
Promote gender equity &empower women
Goal 4
Reduce Child Mortality
Improving services enhances enrolment/retention of girls
Improved services enhances women's dignity and ability to lead
Env. Sanitation has great bearing on morbidity/mortality
Goal 1
Eradicate Extreme Poverty
Improved Env. Sanitation has great employment potential for "green collar" jobs essential for productive lives &
Env. Sanitation : Key Ingredient of reaching GPRS &MDGs
improving services reduces pre and post-natal risks
Goal 5
Improve Maternal Health
multi-sector partnership is essential for tackling cross-cutting issues
Goal 8
Develop a global partnership for development
Env. Sanitation contributes to the state and health of the environment & all people
Env. sanitation has direct effects on health-care waste mgt. & vector and water borne diseases that affect millions
Goal 6
Combat HIV/AIDS, Malaria & other disease
Goal 7
Ensure Environmental Sustainability

4

532. Regarding Target 7c the calculated MDG Target for improving household basic sanitation based on 1990 coverage of is 54%.

533. The NESSAP additionally provides targets for other components of environmental sanitation. These are presented in Chapters 4 and 5, and as part of a number of indicators of the Results-Based Monitoring and Evaluation (R-B M&E) of Chapter 6.

5 Requirements for Improving Services and Infrastructures

5. Requirements for Improving Services and Infrastructure

5.1 General Introduction

534. The requirements for proposed improvements in services follow from the measures and action plan targets summarized in Chapter 4. The NESSAP is planned to be implemented over three broad phases 2010 – 2015, 2016 – 2020, 2021 – 2025.

535. Following on the measures and action indicated, the first phase of the NESSAP is formulated to achieve the *immediate*, *short-term* and aspects of *medium-term* strategies of the NESSAP by 2015, the target year of the Millennium Development Goals (MDGs).

536. In order to emphasise the institutional strengthening aspects of improvements which though very critical are often neglected six of the focus areas (Capacity enhancement & management support, Environmental Sanitation Educations (Information, Education and Communication), Enforcement Management (Legislation and regulation), Sustainable financing and cost recovery, Research and development, and Monitoring and Evaluation) are grouped together as "*enabling elements*". The seventh focus area - "*levels of service*" - which covers the physical infrastructure and services which are to be improved over time are further classified as Incremental Service Improvement Options (ISIOs). These two categories broadly correspond to "software" and "hardware" measures and/or activities of the plan respectively, as presented in Box 5.1 below

Box 5.1: Details of Enabling Elements and Levels of Service

Enabling Elements	*Levels of Service*
- Capacity enhancement & management support - Environmental Sanitation Educations (Information, Education and Communication) - Enforcement Management (Legislation and regulation) - Sustainable financing and cost recovery - Research and development - Monitoring and Evaluation	***Incremental Service Improvement Options (ISIOs)*** for -solid waste management - material recovery and disposal facilities (e.g. landfills) - excreta (liquid waste) management - stormwater and sullage conveyance - health-care facility waste

537. Physical infrastructure can further be categorized either as "bulk" or "local" depending on whether its effects are communal (area-wide) or per premises (i.e. on-plot). For example communal drains for conveyance of storm-water and sullage, sewer networks, as well as final treatment for liquid and solid wastes are considered "bulk" infrastructure; these do not necessarily reflect housing-segment characteristics.

538. The provision of infrastructure and services is also designated in some cases according to size of localities. The locality sizes used in the NESSAP corresponds to those indicated in the Ghana Landfill Guidelines, 2002, as shown in Table 5.1.

Table 5.1: Classification of Localities (adapted from GLG, 2002)

Designation	Contributing Population	Waste Quantity (T/day)
Metropolitan	> 250,000	>150
Municipal	95,000 – 250,000	50 – 150
Large Urban	40,000 – 95,000	20 – 50
Small Urban	15,000 – 40,000	8 – 20
Large Rural	5,000 – 15,000	3 – 8
Small Rural	<5,000	<3

539. The process followed in determining the improvements required for implementing the *enabling elements* and achieving the service targets and the corresponding additional resources i.e. "financing gap", is presented in Figure 5.1. The process is the basis for the model adopted for the accompanying Strategic Environmental Sanitation Investment Plan (SESIP).

5.2 Options for Enabling Elements

540. Analyses of how to effectively implement the activity (ies) and operationalise the measures for each of the *enabling elements* of the NESSAP gives an indication of the additional resources needed.

541. The resources for *Enabling elements* covering *Capacity Enhancement and Management Support, Environmental Sanitation Education (*covering all aspects of Information, Education and Communication, IEC), *Enforcement Management (Legislation and Regulation), Financing and Cost Recovery, Research and Development, Monitoring and Evaluation* are derived by estimating what is required for implementing the activities of the measures indicated in Tables 4.1 – 4.7 of Chapter 4.

542. The activities are derived from the measures related to objectives A1 – A5, B1 – B6, C1 – C7, D1 – D3, F1 – F3, G1 – G3, and aspects of E1 and E2 (under Levels of Service).

543. For a number of measures it is practical to indicate the costs of *enabling elements* as proportion of that of 'management support' due to incremental operational activities. Where this is applied the specific category of *enabling element* should be clearly indicated.

544. A special case is made for CLTS as a tool for scaling-up improved environmental sanitation services with community participation as central. Among the lessons learned from implementing CLTS at international level[33] are (i) that Open-Defaecation-Free (ODF) status of communities are a necessary but insufficient condition to good environmental sanitation and hygiene, and (ii) that other infrastructure have an influencing factor for changing sanitation practices.

545. A recent evaluation of CLTS experience under projects implemented in Ghana by CWSA, PLAN, WaterAid and UNICEF[34] showed that communities have attained ODF status with well maintained compounds: refuse pits and provision of handwashing facilities with soap. In addition, extension workers have been sensitized to emphasize empowerment of community members for sustainable environmental sanitation behavior instead of focusing on hygiene education.

546. These lessons support the need to tackle environmental sanitation holistically as is the case for the NESSAP.

[33] See pp. 266,292,388 and entire sections in Beyond Construction, Use by All. WaterAid, IRC, WSSCC. 2008.
[34] Evaluation of Strategy for Scaling up Community-led Total Sanitation in Ghana, Magarla, J. M. and Roberts, L. August 2009.

5.3. Options for Levels of Services

547. The determination of what is required for improving Levels of Service is carried out through a detailed analysis of proposed measures against specific service targets.

548. The activities (interventions) are those related to objectives E2 – E5 and the proposed measures.

549. The proposed requirements for improvements are also based on the three qualitative service-levels defined by the MLGRD/MEST. These qualitative levels of service are ***"minimum, comfortable, and amenity***"35.

550. The above levels of service are detailed further to correspond to specific modes referred to as *Incremental Service Improvement Options* (ISIOs). The ISIOs present a basis for gradual improvements for selected components of environmental sanitation.

551. The existing situation is analysed for each of the service areas (or types of services) for the key components of environmental sanitation services. Comparing the current (existing) situation of any locality (community) with the target *Incremental Service Improvement Options* (ISIOs) provides a basis for estimating the gap(s) required for improvement (see Figure 5.1). Resources to meet the gap are then derived using unit costs and/or expenditure functions.

552. As there can be several modes of providing services to meet the qualitative description of levels of service ("minimum", "comfortable" and "amenity") the ISIOs in the NESSAP and the modes of services and facilities described are based on expert judgment.

553. The ability to adapt these modes to suit individual conditions in each locality presents the challenge of designing a flexible programme that can be used by MMDAs (and their sub-divisions)[36] to update their baseline data and hence DESSAPs.

554. In the following sections the ISIOs for the key components of environmental sanitation are described.

5.3.1 Incremental Service Improvement Options (ISIOs)

555. The service levels for each component of environmental sanitation are indicated as Incremental Service Improvement Options (ISIOs) to be achieved over the three planning periods, 2010-2015, 2016-2020, and 2021-2025. Thus, for each component of environmental sanitation the existing level of service is determined (based on information on DESSAPs and other sources such as Population and Housing Census), and the expected incremental improvements to any of the minimum, comfortable, and amenity levels proposed respectively.

556. In the initial situation service levels may differ among communities and types of services, thus MMDAs and their subdivisions will necessarily focus on those services lagging behind to improve to the "minimum" level.

557. For example, if it is assumed that at present, in a certain community, the service level for a certain component of environmental sanitation is unacceptable. The required improvement will be to attain the "minimum" level by 2015 or earlier.

558. In another instance, the community may operate its services at the "minimum" level with respect to some components, such as collection of solid waste, while its service level on other components, for example excreta management, may be "unsatisfactory".

[35] Qualitative description of "unacceptable, minimum, comfortable and amenity" levels of service Preparation of District Waste Management Plans in Ghana. Best Practice Environmental Guidelines Series No.3. EPA/MES/MLGRD, July 2002.
[36] A computer programme MINT*ESAA based on the concepts of Material in Transition (MINT) and Environmental Sanitation Assessment and Audits (ESAA) when fully developed will allow users to make alternate choices regarding *enabling elements* and ISIOs.

In this case, the community may want to increase the service level on excreta management to the "minimum" level by 2015, while keeping the collection of solid waste at its present level or improve it further.

559. The community would aspire to moving forward with both components, so that solid waste management is improved to the comfortable level, at the same time as the excreta management is improved initially to the minimum level. This will ensure integrated environmental sanitation improvement and management.

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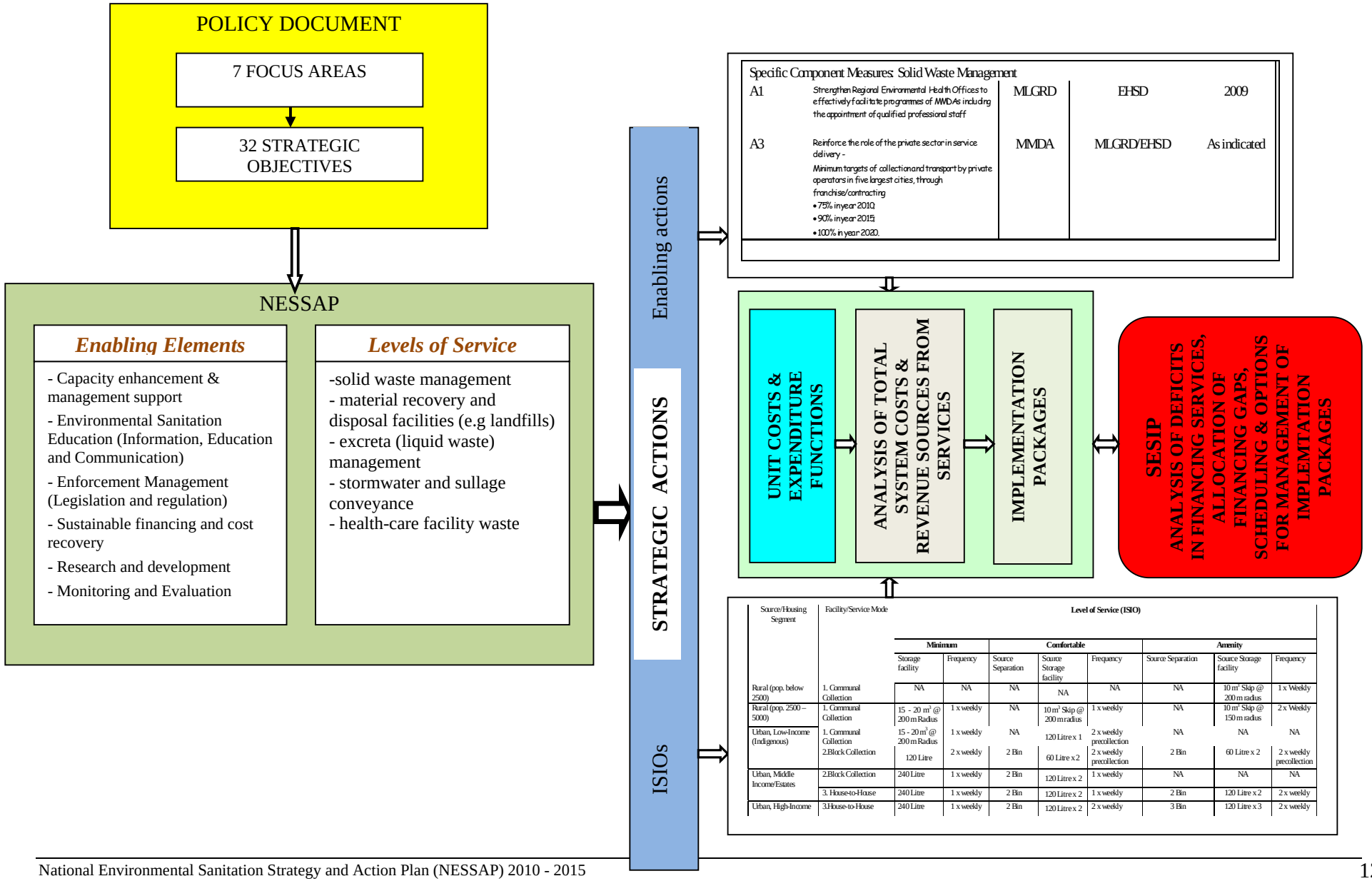
Figure 5.1:Model of process flow measures, actions and implementation packages (NESSAP/SESIP)


POLICY DOCUMENT
7 FOCUS AREAS
32 STRATEGIC OBJECTIVES
NESSAP
Enabling Elements
- Capacity enhancement & management support
- Environmental Sanitation Education (Information, Education and Communication)
- Enforcement Management (Legislation and regulation)
- Sustainable financing and cost recovery
- Research and development
- Monitoring and Evaluation
Levels of Service
-solid waste management
- material recovery and disposal facilities (e.g landfills)
- excreta (liquid waste) management
- stormwater and sullage conveyance
- health-care facility waste
Enabling actions
STRATEGIC ACTIONS
ISIOs
Specific Component Measures: Solid Waste Management
A1 Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff — MLGRD — EHSD — 2009
A3 Reinforce the role of the private sector in service delivery - Minimum targets of collection and transport by private operators in five largest cities, through franchise/contracting • 75% in year 2010 • 90% in year 2015 • 100% in year 2020. — MMDA — MLGRD/EHSD — As indicated
UNIT COSTS & EXPENDITURE FUNCTIONS
ANALYSIS OF TOTAL SYSTEM COSTS & REVENUE SOURCES FROM SERVICES
IMPLEMENTATION PACKAGES
SESIP ANALYSIS OF DEFICITS IN FINANCING SERVICES, ALLOCATION OF FINANCING GAPS, SCHEDULING & OPTIONS FOR MANAGEMENT OF IMPLEMTATION PACKAGES
Level of Service (ISIO)
Source/Housing Segment | Facility/Service Mode | Minimum: Storage facility, Frequency | Comfortable: Source Separation, Source Storage facility, Frequency | Amenity: Source Separation, Source Storage facility, Frequency
Rural (pop. below 2500) | 1. Communal Collection | NA | NA | NA | NA | NA | NA | 10 m³ Skip @ 200 m radius | 1 x Weekly
Rural (pop. 2500 – 5000) | 1. Communal Collection | 15 - 20 m³ @ 200 m Radius | 1 x weekly | NA | 10 m³ Skip @ 200 m radius | 1 x weekly | NA | 10 m³ Skip @ 150 m radius | 2 x Weekly
Urban, Low-Income (Indigenous) | 1. Communal Collection | 15 - 20 m³ @ 200 m Radius | 1 x weekly | NA | 120 Litre x 1 | 2 x weekly precollection | NA | NA | NA
Urban, Low-Income (Indigenous) | 2.Block Collection | 120 Litre | 2 x weekly | 2 Bin | 60 Litre x 2 | 2 x weekly precollection | 2 Bin | 60 Litre x 2 | 2 x weekly precollection
Urban, Middle Income/Estates | 2.Block Collection | 240 Litre | 1 x weekly | 2 Bin | 120 Litre x 2 | 1 x weekly | NA | NA | NA
Urban, Middle Income/Estates | 3. House-to-House | 240 Litre | 1 x weekly | 2 Bin | 120 Litre x 2 | 1 x weekly | 2 Bin | 120 Litre x 2 | 2 x weekly
Urban, High-Income | 3.House-to-House | 240 Litre | 1 x weekly | 2 Bin | 120 Litre x 2 | 2 x weekly | 3 Bin | 120 Litre x 3 | 2 x weekly

5.3.1.1 ISIOs for Solid Waste Management

560. ***Municipal Solid Waste Collection and Transport***: based on the predominant mode of housing and common collection services currently employed. Tables 2.1 and 2.2 indicate the service options adopted for refuse collection and the typical transport modes defined in the NESSAP.

561. In line with planned improvements in service levels, the ISIOs indicate a gradual introduction of source-separation of refuse. This is a reflection of the strategies that shall be implemented to achieve the policy objectives of reduction, reuse, recycling and recovery (4Rs) and the related "MINT" strategies.

562. ***Sweeping of Streets and Public Places (Central Business Districts, Taxi/Bus/Lorry Terminals, Markets, etc.)***: indiscriminate littering contributes to the many unsightly conditions prevailing in almost all public places especially markets and bus terminals. There are no specific ISIOs for sweeping of streets and public places, but a minimum desirable level of ensuring absence of accumulated refuse within the vicinity of public activity, particularly, during peak hours.

563. The applicable service standard is to adopt the practice of engaging waste-pickers to frequently rid such places of refuse and provision of strategically located refuse storage bins together with consistent education and enforcement of nuisance bye-laws.

564. ***Cleaning of Beaches and Shores***: Ghana's beaches have not been attractive as result of the deposit of solid waste material into drains and water courses carried by rivers into the sea, particularly during rains, and their subsequent wash back unto the beaches. Also almost all the communities living on beaches traditionally use the beaches as their place of convenience and defecate indiscriminately at the beaches and thus devaluing any touristic use.

565. Annex 3 shows all the twenty one (21) MMDAs that have coast lines and beach communities. Three of these are metropolitan assemblies with large populations that impact greatly on the sanitary conditions of the beaches. There are no readily available cost-functions for this activity.

566. ***Mining (evacuation) of Large Refuse Dumps in Small, Medium and Large Towns***: the baseline data compiled on refuse dumps indicates a large number of unauthorized refuse dumps scattered nationwide. In many cases they are located either on vacant private lots of land or on community lands earmarked for recreational activities. There are no available unit cost functions for this activity.

567. ***Material Recovery (and Treatment) Facilities***: Tables 5.5 and 5.6 indicate examples of facilities for typical MSW recovery, treatment and disposal operations. In keeping with the underlying NESSAP principle of investing more in "4Rs" all final disposal and treatment facilities (including landfills,. UASBs etc) are designated as Material Recovery Facilities (MRFs).

568. The sitting of faecal sludge treatment facilities together with solid waste treatment where feasible, in order to optimize the gains from additional mechanical, biological treatment (MBT) is recommended as good practice.

569. In accordance with the GLG, 2002, five types of landfilling are considered in the NESSAP. The "minimum" operation to be achieved is one of controlled (improved) manual-dumping operations while emphasising composting of the bio-degradable organic fraction (BoF) of the waste stream (see Table 5.5). Where inert material is land-filled it is regarded only as stored temporarily until it is mined.

570. A special category of Material Recovery Facility (MRF) is ***Waste Electrical and Electronic Equipment*** (WEEE, e-waste belongs to this category) collection and

handling centres to cater for the growing quantities of imported used equipment whose end-of-life occurs in our cities, towns and villages.

571. The Environmental Protection Agency (EPA) has developed guidelines for the establishment of such facilities and it is expected that the private sector will benefit from investments as a result of the EU Directive for handling end-of-life of electrical and electronic equipment originating from the EU.

572. ***Recycling plants (stations)*** are increasingly being installed by the private sector and this will be supported as a means of reaching the "4Rs" objective. This far the preference of the private sector has been in metal and plastic recycling. A number of "bring" stations will be established to cater for household-level recyclable material, other difficult-to-handle bulky and hazardous waste.

573. ***Composting plants*** will be developed and managed as part of all categories of final disposal sites as a minimum ISIO for MRFs.

5.3.1.2 ISIOs for Excreta (Liquid Waste) Management

574. The facilities for 'hygienic disposal of human excreta' shown for the various levels of service are indicative only and based on commonly encountered technologies used in Ghana. For consistency the housing segments applied for SWM are also applied in this case, with more details. The distribution also follows the predominant sanitation planning areas that have been used for a number of Strategic Sanitation Plans (SSPs) for Ghana's five largest cities.

575. The technologies shown are not prescriptive as the ESP, Revised 2010 emphasizes the concept of "sanitation ladder" and thus endorses all categories of improved technologies.

576. For wastewater collection systems, the levels of service are those applicable to the main housing segments. For public toilets serving urban communities it is assumed that upgrading from on-plot systems to interceptor tanks for small-bore sewerage systems and then to shallow (simplified) sewers is the appropriate and logical improvement in levels of service.

577. Due to the predominance of on-site systems that require off-site treatment of a mixture of septage (contents from unsettled septic tank) and faecal sludge (night-soil) of high organic loading (BOD) from public toilets, the treatment systems covered are the common robust examples that have been applied locally in Ghana.

578. Adoption of decentralised-excreta-treatment-resource-recovery and re-use (DETERRR) systems is also recommended. Bio-digester is one of the favourable options for decentralized-excreta-treatment-resource-recovery and reuse systems which can lead to cost-reduction in developing central treatment facilities, especially for handling faecal sludge from public toilets and domestic on-plot systems.

579. Another dimension for improving environmental sanitation, as proven elsewhere is the adoption of Community-Led Total Sanitation (CLTS) as a nation-wide strategy for sanitation promotion in rural areas and small towns of population less than 7,500.

580. Therefore, in considering the indicated technologies for excreta management and the required improvements, account has to be taken of current trends of focusing more on awareness-raising for change in sanitation-behaviour and promotion of improved public health and sanitation systems. These issues are handled more effectively under *enabling elements* so as to ignite and sustain uptake by households and communities.

Table 5.2: Typical Housing Segments, Collection/ Transport Service Modes

Source/Housing Segment	Facility/Service Mode	Level of Service (ISIO)							
		Minimum		Comfortable			Amenity		
		Storage facility	Frequency	Source Separation	Source Storage facility	Frequency	Source Separation	Source Storage facility	Frequency
Rural (pop. below 2500)	1. Communal Collection	NA	NA	NA	NA	NA	NA	10 m^3 Skip @ 300 m radius	1 x Weekly
Rural (pop. 2500 – 5000)	1. Communal Collection	15 - 20 m^3 @ 500 m Radius	1 x weekly	NA	10 m^3 Skip @ 300 m radius	1 x weekly	NA	10 m^3 Skip @ 250 m radius	2 x Weekly
Urban, Low-Income (Indigenous)	1. Communal Collection	15 - 20 m^3 @ 250 m Radius	2 x weekly	NA	120 Litre x 1	2 x weekly precollection	NA	NA	NA
	2.Block Collection	120 Litre	2 x weekly	2 Bin	60 Litre x 2	2 x weekly precollection	2 Bin	60 Litre x 2	2 x weekly precollection
Urban, Middle Income/Estates	2.Block Collection	240 Litre	1 x weekly	2 Bin	120 Litre x 2	1 x weekly	NA	NA	NA
	3. House-to-House	240 Litre	1 x weekly	2 Bin	120 Litre x 2	1 x weekly	2 Bin	120 Litre x 2	2 x weekly
Urban, High-Income	3.House-to-House	240 Litre	1 x weekly	2 Bin	120 Litre x 2	2 x weekly	3 Bin	120 Litre x 3	2 x weekly
Urban, New developing Areas (Esikafo-amba-ntem)	4.Mobile Communal Container Collection	240 Litre	1 x weekly precollection	2 Bin	120 Litre x 2	2 x weekly precollection			
Commercial (incl. markets, lorry parks, hotels, restaurants, slaughter hses etc)	5. Communal Container Transfer	15 m^3 x (multiple No.	Daily Collection	Container + Container recyclables	15 m^3 x (multiple No.)	Daily	Container + container recyclables +compostables	15 m^3 x No.	Daily
	6.mini-container Service	1m^3 x (multiple No.	Daily	mini-container + recyclables	1m^3 x (multiple No.	Daily	Container + container recyclables +compostables	1m^3 x (multiple No.Daily	Daily
Institutional (incl. barracks, colleges, health-care facilities)	2.Block Collection	240 Litre	1 x weekly	2 Bin	120 Litre x 2	1 x weekly			
	3. House-to-House	240 Litre	1 x weekly	2 Bin	120 Litre x 2	1 x weekly	2 Bin	120 Litre x 2	2 x weekly
Industries	5. Communal Container Transfer	15 m^3 x (multiple No.	Daily Collection	Container + Container recyclables	15 m^3 x No.	Daily	Container + container recyclables +compostables	15 m^3 x No.	Daily

Table 5.3: Typical Refuse Collection Vehicles (RCVs) for Service Modes

Source/Housing Segment	Facility/Service Mode	Level of Service		
		Minimum	Comfortable	Amenity
Rural (pop. below 2500)	1.Communal Collection	NA	NA	Skip Loader
Rural (pop. 2500 – 5000)	1. Communal Collection	NA	Skip Loader	Skip Loader
Urban, Low-Income (Indigenous)	1. Communal Collection	Skip Loader, Roll-on-off	Skip Loader, Roll-on-off, Tricyle	NA
	2.Block Collection	Tipper (with Tarpaulin), Skip Loader	Skip Loader, Tricycle	10 m^3 Compaction Truck, Tricycle
Urban, Middle Income/Government-type Estates	2.Block Collection	15 – 20 m^3 Compaction Truck	15 – 20 m^3 Compaction Truck, Tricycle	NA
	3. House-to-House	15 – 20 m^3 Compaction Truck	15 m^3 Compaction Truck	10m^3 Compaction Truck
Urban, High-Income	3.House-to-House	15 – 20 m^3 Compaction Truck	15 m^3 Compaction Truck	10m^3 Compaction Truck
Urban, New developing Areas (Esikafo-amba-ntem)	4.Mobile Communal Container Collection	Skip Loader, Tricycle	Skip Loader, Tricycle	NA
Commercial (incl. markets, lorry parks, hotels, restaurants, slaughter hses etc)	5. Communal Container Transfer	Roll-on-off, Skip Loader	Roll-on-off, Skip Loader	Roll-on-off, Skip Loader
	6. Mini-container Service	Skip Loader	Skip Loader	Skip Loader, 10 m^3 Compaction Truck
Institutional (incl. barracks, colleges, health-care facilities)	2.Block Collection	15 – 20 m^3 Compaction Truck	15 m^3 Compaction Truck	
	3. House-to-House	15 – 20 m^3 Compaction Truck	15 m^3 Compaction Truck	10m^3 Compaction Truck
Industries	5. Communal Container Transfer	Skip Loader, Roll-on-off	Skip Loader, roll-on-off	Skip Loader
Bulk-Tranfer-Haulage	7. Haulage Transfer Station (Depot)	15 – 20 m^3 Compaction Truck	40 – 50 m^3 Bunker Trucks	Rail Transfer

Table 5.4: Phasing pf ISIOs for Landfill

Landfill Type	Capacity (tonnes/day)	Contributing Population	***Minimum***	***Comfortable***	***Amenity***
			2010 – 2015	*2016-2020*	*2021 – 2025*
Metropolitan	>150	> 250,000	HDA	SL, Bioreactor –WTE	SL, Bioreactor-WTE
Municipal	50 – 150	95,000 - 250,000	HDA	HDA	SL, Bioreactor-WTE
Large Urban	20 – 50	40,000 - 95,000	ID-mech.	ID-mech.	ID-mech.
Small Urban	8 – 20	15,000 - 40,000	ID-manual	ID-mech.	ID-mech.
Large Rural	3 – 8	5,000 - 15,000	ID-manual	ID-manual	ID-manual
Small Rural	<3	< 5000	ID-manual	ID-manual	ID-manual

Notes: HDA –High-Density Aerobic Landfills, SL – Sanitary Landfill, WtE – Waste-to-Energy, ID-manual- Improved Dumping - Manual, ID-mech.- Improved Dumping Mechanised

Table 5.5: MSW recovery, treatment and disposal facility operations

Facility No. (Code)	ISIO		
	Minimum	Comfortable	Amenity
1.	MRF: Improved (Controlled) Dumping – Manual/Mechanical, Composting of BoF	MRF:Controlled Landfill (HDA), MBT	MRF – Controlled Landfill (bio-reactor), composting, energy recovery, MBT
2.	MRF: Mixed Waste; Composting of BoF;Recycling – Mixed Recyclables	MRF: Recycling - Source Separated Recyclables, Composting of BoF	
3.	Special collection of WEEE	MRF – WEEE	MRF – WEEE

Notes: MRF – Material Recovery Facility, BoF – Biodegradable Organic Fraction, HDA – High-Density Aerobic, WEEE – Waste Electrical and Electronic Equipment.

Table 5.6:Types of Excreta Disposal/ Treatment Technologies

A. Typical Household Facilities	ISIOs (Examples Only – all appropriate technology options applicable)		
	Minimum	**Comfortable**	**Amenity**
Rural (pop. 2500)	VIP, Ecosan etc.	KVIP, Ecosan, Pour-Flush	KVIP, Ecosan, Pour Flush,
Indegenous (Compound)	VIP,K-VIP, Ecosan, etc.	VIP, KVIP, Ecosan, Pour Flush, WC-ST	VIP, KVIP, Ecosan, Pour Flush, WC-ST, simplified sewerage
Multi-Storey (Compound) –Tenement	Pour Flush,WC-ST, etc.	Ecosan, WC-ST, Simplified sewerage	Ecosan, WC-ST, Simplified Sewerage
Estates	Ecosan, WC-Septic Tank (ST), etc.	Ecosan, WC-ST, Simplified sewerage	Ecosan, WC-ST, Simplified Sewerage
High Cost	Ecosan, WC-Septic Tank (ST), etc.	Ecosan, WC-ST, Simplified sewerage, Bio-digestion	Ecosan, WC-ST, Simplified sewerage, Bio-digestion
New Developing Areas (Fringe)	Ecosan, WC-Septic Tank (ST), etc.	Ecosan, WC-ST, Simplified sewerage	Ecosan, WC-ST, Simplified Sewerage
B. Public, Communal (Neighbourhood)			
Neighbourhood	Aqua-Privy, Pour Flush, WC-ST,etc	WC-ST, PT-Small Bore sewerage, Bio-digestion	WC-ST, Simplified sewerage, Bio-digestion
Markets Lorry Stations	Pour Flush,WC-ST, etc.	WC-ST, PT-Small Bore sewerage	WC-ST, Simplified sewerage
C. Commercial			
Hotels	WC-ST, etc.	WC-ST, PT-Small Bore sewerage, Bio-digestion	WC-ST, Simplified sewerage, Biodigestion
Restaurant	WC-ST, etc.	WC-ST, PT- Small Bore sewerage	WC-ST, Simplified sewerage
Slaughter Houses, Abattoirs	WC-ST, etc.	WC-ST, PT-Small Bore sewerage, Biodigestion	WC-ST, Simplified sewerage, Biodigestion
D. Institutional			
Schools	K-VIP, Pour flush, Biofil,,ecosan,	WC-ST, Bio-digestion, Biofil, ecosan	WC-ST, Biofil, Simplified sewerage, Bio-digestion, ecosan
Police/Army/Prison Barracks	WC-ST, etc.	WC-ST	WC-ST, Simplified sewerage
Prison Complex	WC-ST, etc.	WC-ST,Bio-digestion	WC-ST, Simplified sewerage, Bio-digestion
Health Facilities (hospital, Clinic, maternity home etc)	WC-ST, etc.	WC-ST, Bio-digestion, biofil	WC-ST, Simplified sewerage, Bio-digestion
Offices	WC-ST, etc.	WC-ST, Simplified Sewerage	WC-ST, Simplified sewerage
E. Industrial Premises	WC-ST, etc.	WC-ST, special package plants	WC-ST, Simplified sewerage, special package plants
F. Haulage & Conveyance	mechanised desludging and haulage of septage (mds)	mds, sewer	mds, sewer
G. Treatment & Disposal	FSTP, WSP, Bio-digester	FSTP, WSP + Aeration, Bio-digester, UASB	FSTP, WSP, Bio-digester (incl. UASB)

For domestic premises, small clinics and rural schools with large plots, bio-digestion (e.g. vermin ingestion) without harvesting of biogas can also be applied with sand-filtration of separated wastewater.

5.3.1.3 ISIOs for Stormwater Drainage and Sullage Conveyance

581. Storm-water drainage is categorized as bulk infrastructure as it is typically not related to population nor housing segments but more to rainfall intensity and ground conditions. Generally, the more paved an area is the more run-off results due to reduced infiltration. However, in newly developing areas and low-income indigenous areas, the lack of covered vegetation (e.g. grassed plots) lead to erosion and creation of gullies.

582. The quantity of sullage ("grey water" from bathhouses and kitchens) is linked to population (or some water-based activity) and the type of "grey water" facilities available in a premises. The provision of small drains along the sides of buildings and/or soakage-pits to carry grey-water constitutes important improvement elements at the household level.

583. The NESSAP limits the improvement for drainage and sullage conveyance to secondary and tertiary drains within the built environment starting with unlined ditches as a minimum level, stone-pitched and/or concrete lined drains as comfortable level, and covered stone-pitched and/or concrete lined drains as amenity level. The improvements for major primary drainage infrastructure are covered under special projects handled by the Hydrological Services Department (HSD) of the Ministry of Water Resources, Works and Housing (MWRWH) or specific project-management-units[37].

584. Drain cleansing (in CBDs and flood-prone areas) is captured under this section although it is typically provided together with street sweeping under municipal waste management services. Drain cleansing is also and often denoted as "de-silting" for either maintenance of road-side drains or as a flood control measure and covered as in the budget of Department of Urban Roads (DUR) or HSD of MWRWH.

585. The minimum service level assumed entails the cleansing of community drains (450/600 diameter) once a week during dry seasons and three-times weekly during rainy seasons.

5.3.1.4 ISIOs for Health-Care Facility and Special Industrial Wastes

586. Special Industrial Wastes: cost of services for special industrial waste are not covered in the SESIP as industries are required to cater for this category of wastes.

587. ***Health-Care Facility Wastes***: services for special Health-Care Facility (HCF) wastes are not covered since HCFs are expected to handle this category of wastes themselves following prescriptions for disinfection, sterilization and/or incineration as applicable and provided for in policies and guidelines[38]. The provision of municipal-type waste and enforcement management is considered as part of solid waste services.

588. Table 5.7 shows the ISIOs for managing HCF wastes. The opportunity for effective co-treatment of bio-medical (pathological) waste, the Bio-degradable Organic Fraction (BoF) of MSW and wastewater while harvesting biogas through bio-digestion is given consideration.

589. HCFs (as well as Prison complexes) present classical examples of how to apply bio-digestion with opportunities for earning carbon-credits[39]. It is assumed that at the amenity level the recovered biogas is used for heating and cooking, while the treated effluent is recycled for cistern flushing as a potential strategy for saving potable water.

[37] The Projects Coordinating Unit (PCU) of the MLGRD managing the Urban Environmental Sanitation Project series with loan-financing from the IDA-World Bank.
[38] Guidelines for the Management of Health-Care and Veterinary Waste in Ghana, EPA/MLGRD, 2002. Policy and Guidelines for Health-Care Facility Waste, MoH, 2008.

Table 5.7: ISIOs for Managing HCF Wastes

Facility No. (Code)	Category	Level of Service		
		Minimum	**Comfortable**	**Amenity**
1	special HCF Wastes (see MoH Policy & Guidelines, 2008)	disinfection prior to disposal	special separate treatment (disinfection, sterilisation, and/or incineration)	special separate treatment (disinfection, sterilization)and/or incineration with effective scrubbing of emissions
2	Bio-medical Waste	on-plot burial or septic tank + Bio-digestion	Bio-Digestion + BoF of MSW + wastewater + use of heat	Bio-digestion + BoF of MSW + Wastewater + recycling of effluent water for cistern flushing + use of heat
3	BoF of MSW stream	Collection and transport through municipal service		

590. Due to a lack of a credible register of the main types of industrial wastes and their possible varied nature, the NESSAP does not provide ISIOs for ***special industrial wastes***. The need for assessments and enforcement is provided for as part of enabling elements.

5.4 Requirements for improving Enabling Elements

591. A number of measures are repeated across focus areas of Table 4.1 – 4.7 under Chapter 4. Where activities are also similar or the same they are aggregated and placed under the focus area where these appear for the first time.

592. Based on the measures and related activities estimates have been derived for *enabling elements*. Tables 5.8 to 5.13 indicate the consolidated national level requirements for the period 2010 - 2015.

Table 5.8: Costs for Implementing Capacity Development Measures of *Enabling Elements*

A. Capacity Development				
Obj No.	**Measure**	RECURRENT (O&M)	CAPITAL	TOTAL
A1	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff			
	• Upgrade ICT Equipment etc	79,000	28,500	107,500
	• Enhance facilitation capacity of REHOs (training, mobility etc.)	2,110,000	350,000	2,460,000
	• Appoint 1 Environmental Health Technologist per district by 2020	780,000	-	780,000
	• Appoint 1 Drainage Maintenance Engineer per Metropolitan and Municipal Assembly by 2015	540,000	-	540,000
	• Appoint 1 Public Health Engineer per Metropolitan and Municipal Assembly by 2015	540,000	-	540,000
	• Appoint 1 Planner per REHSD by 2015	510,000	-	510,000
	• Appoint 1 Public Health Engineer per REHSD by 2015	540,000	-	540,000
A2	Provide necessary logistics and funding for NESPoCC activities, to begin in Nov. 2007 and sustained	58,000	-	58,000
A3	Upgrade Schools of Hygiene to tertiary institutions for Hygiene and Environmental Sanitation – including curriculum, structure and staffing			
	• Review curriculum and training courses of SH	15,000	-	15,000
	• Restructure SHs and place under MoESS	22,500	-	22,500
	• Upgrade SH to tertiary institutions	33,500	2,500,000	2,533,500
	Provide specialised training in the areas of environmental protection, contract management and supervision, planning, public relations, monitoring and evaluation	1,500,000	-	1,500,000
	Mainstream the use of ICT through training to enhance information management	375,000	-	375,000
A4	Provide logistics and appropriate working tools for management of environmental sanitation services	-	1,800,000	1,800,000
	Sub-Total General Measures			11,781,500
Specific Component Measures: Solid Waste Management				
A3	Reinforce the role of the private sector in service delivery - (**Review of Franchise Scheme**) Minimum targets of collection and transport by private operators in five largest cities, through franchise/contracting • 75% in year 2010;	92,700	-	92,700
	Sub-Total Cdevp SWM			92,700
Specific Component Measures: Excreta (Wastewater) Management				
A3	Minimum targets for home-latrine coverage through promotion by trained artisans (accompanied by Community-led Total Sanitation) • 10% - 35%, 2010 - 2015	124,177,500		124,177,500
	• Support installation of bio-digesters and packaged plants by private operators	38250		38,250
	Sub Total Cdevp Excreta Management			124,215,750
Specific Component Measures: Storm Water Drainage and Sullage Conveyance				
A1	Strengthen REHOs to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff • Implement training programmes for drainage planning and maintenance management	62500		62,500
	Sub Total Cdevp Drainage & Sullage Conveyance			62,500
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)				
A3	Support effective implementation of ESICOME and related programmes • Update ESICOME programme to include CLTS by end-2008	39270		39,270
	• Implement Annual training programmes for REHSD and EHMDs in MMDAs commencing from 2008	1,080,000		1,080,000
A5	Update knowledge and skills of environmental health officers to deal with marine-pollution related issues	375000		375,000
	Review the mandates of port health inspections to include marine pollution	9900		9,900
	Sub Total Cdevp ES Education and Enforcement			1,504,170
Specific Component Measures: Health-care, Industrial and Hazardous Wastes				
A1	Strengthen Regional Environmental Health Offices to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff by 2009 • Implement Annual training programmes for REHSD and EHMDs in MMAs in clinical/hazardous waste management commencing from 2010	750000		750,000
	Appoint appropriately qualified staff to MMDAs including, sanitary engineers, environmental health			750,000
	Grand Total Cdevp	-		138,406,620

Table 5.9: Costs for Implementing IEC Measures of *Enabling Elements*

Focus Area: B. Information, Education and Communication				
General Measures				
Obj No.	**Measure**	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
B1	Ensure widespread dissemination of policy at all levels	90,000		90,000
	. Reprints	80,000		80,000
B2	Raise the profile of the Environmental Sanitation Day (ENSADA) by declaring it a statutory cleanup day at all levels			
	Every community shall adapt environmental sanitation practices consistent with the national environmental sanitation policy			
	Promote awareness of the important roles of households, communities and the private sector in environmental sanitation services (annual campaigns)	100,000	-	100,000
B3	Develop and/or update standards and guidelines for all components of environmental sanitation services at all levels and segments	250,000	-	250,000
	Ensure widespread dissemination of all standards and guidelines	150,000	-	150,000
	Establish monitoring and evaluation framework for implementation of standards and guidelines (including the use of environmental sanitation assessments and audit procedures)	7,500	-	7,500
B4	Ensure the involvement of traditional authorities and the consideration of diversity of religious beliefs and cultural practices at all levels	35,000	-	35,000
	Sub-Total General Measures			542,500
Specific Component Measures: Solid Waste Management				
B4	Promote benefits of alternative uses of wastes through Reduction, Re-use, Recycling and Recovery (annual campaigns)	-	300,000	300,000
	Promote use of biodegradable materials and minimise use of plastics (annual campaigns)	50,000	50,000	100,000
B6	Develop and apply participatory tools for identification and selection of sites in accordance with strategic environmental assessment principles			
	· Train sector staff in application of SEA tools	25,000	-	25,000
	Sub-Total IEC SWM			425,000
Specific Component Measures: Storm Water Drainage and Sullage Conveyance				
B5	Support advocacy on interventions aimed at restoring and improving wetlands and watercourses, including those in the National Water Policy, National Wetlands Strategy etc	25,000	-	25,000
	Sub-Total IEC Drainage and Sullage Conveyance			25,000
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law Enforcement)				
B4	Develop framework for raising awareness on volumes and types of waste streams generated from all segments of the economy and their impacts	33,000	-	33,000
	Support advocacy on effects of changing life-styles on waste streams	250,000	-	250,000
B5	Support advocacy on interventions aimed at restoring and improving wetlands and watercourses, including those in the National Water Policy, National Wetlands Strategy etc			
	Sub-Total IEC ES Education and Enforcement			283,000
	Grand Total IEC			1,275,500

Table 5.10: Costs for Implementing Legislation and Regulation Measures of Enabling Elements

Focus Area: C Legislation and Regulation				
General Measures				
Obj No.	Measure	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
C1	Ensure enactment of necessary legal instruments to support institutional functions including public-private partnerships, financing and funding arrangements, licensing, monitoring, control and ownership, of wastes, point and non-point discharges	60,000		60,000
Sub-Total General Measures				60,000
Specific Component Measures: Solid Waste Management				
C1	Identify (enact) appropriate legislation on the acquisition of land for treatment and disposal sites (including expropriation) and develop procedures to facilitate site valuation, negotiation and payment of compensation	40,000		40,000
C2	Develop regulation to support waste reduction, re-use, recycling and recovery	11,000		11,000
C4	Enforce legislations/regulations/bye-laws prohibiting the dumping of waste in wet lands and water courses (including drains)	400,000		400,000
Sub-Total Leg&Reg SWM		451000		451,000
Specific Component Measures: Environmental Sanitation Education and				
C2	Ensure that all developments comply with EPA environmental assessment regulations	150,000		150,000
	Support the strengthening of the capacity of the judiciary and law enforcement agencies in dealing with environmental sanitation and related issues	100,000		100,000
	MLGRDE develop model bye-laws covering all aspects of environmental sanitation	10,000		10,000
C6	Institute adequate measures to protect beaches and prevent marine pollution	7,530,000		7,530,000
	Develop rapid response systems for adopting emerging international regulations on issues such as global warming, e-waste and special hazardous waste etc	11,000		11,000
	Enforce/Enact statute for compulsory participation of environmental sanitation officers in destination inspections at entry points	25,000		25,000
Sub-Total Leg&Reg ES Education and Enforcement				7,826,000
Grand Total Leg&Reg				8,337,000

Table 5.11: Costs for Implementing Financing and Cost Recovery Measures of *Enabling Elements*

Focus Area: D Sustainable financing and cost recovery				
General Measures				
Obj No.	**Measure**	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
D1	MMDAs shall establish MMDA-level Environmental Sanitation Fund and actively implement systems to generate sustainable revenue to cover the costs of services	36,700		36,700
D2	Use "polluter- pays" mechanism in determining levels of charges and fees for environmental sanitation services (gradually increase)	50,000		50,000
	MMDAs shall establish separate budget lines for the components of environmental sanitation services and manage revenues for such services separately and exclusively for expenditure directly related to these services	21,630		21,630
	Develop a Strategic Environmental Sanitation Investment Plan (SESIP)	70,625		70,625
	Implement a Strategic Environmental Sanitation Investment Plan (SESIP)	-		-
	Sub-Total General Measures			178,955
Specific Component Measures: Solid Waste Management				
D1	MMDAs shall set tariffs with full participation of private sector service providers and users (to be revised once a year)	225,000		225,000
	MMDAs shall implement differential tariffs to ensure overall cost recovery	-		-
	Sub-Total Fin&Cost Recovery SWM			225,000
	Grand Total Fin&Cost Recovery			403,955

Table 5.12: Costs for Implementing Reasearch and Development Measures of Enabling Elements

Focus Area: F - Research and Development					
General Measures					
Obj No.	**Measure**		COSTS		
			RECURRENT (O&M)	CAPITAL	TOTAL
F1	Support the development of platform for transparent and credible assessment and reporting of sector performance	EHSD	75,000		75,000
F2	Carry out assessments to determine effective demand of communities (urban, peri-urban, small towns and rural) for environmental infrastructure	EHSD	24,550		24,550
	Support studies on alternative technology options for improving services to low-income urban areas, small towns and rural areas	KNUST	90,000		90,000
F3	Ensure that relevant agencies, at all levels, provide timely and reliable data and information for tracking sector progress for national development planning	NDPC	120,000		120,000
	Sub-Total R&D General Measures		309,550	-	309,550
Specific Component Measures: Solid Waste Management					
F1	Develop framework for tracking the volumes and types of waste streams generated from all segments of the economy	EHSD	25,620	-	25,620
	Examine and assess the capabilities of existing research and service institutions and provide appropriate support for research on environmental sanitation	EHSD	36,000	-	36,000
F2	Support local private sector entrepreneurs and artisanal entities to produce machines, equipment and tools appropriate for local use	MoF	75,000	-	75,000
F3	Support research and studies in volumes and types of waste from predominant sectors and segments of the economy (especially sources of non-biodegradable-organic-fractions, special and hazardous wastes)	MoES	65,000	-	65,000
	Support research in handling and alternative uses of existing and Sub-Total R&D SWM	MES	201,620	-	201,620
Specific Component Measures: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection, Law					
F1	Ensure effective dissemination of results of operational research and studies on waste stream composition and volumes from research institutions	RES	125,000	-	125,000
	Sub-Total R&D ES Education and Enforcement		125,000	-	125,000
	Grand Total R&D		636,170	-	636,170

Table 5.13: Costs for Implementing M&E Measures of *Enabling Elements*

Focus Area: G – Monitoring and Evaluation				
General Measures				
Obj No.	**Measure**	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
G1	Institute procedures for carrying out participatory M&E at all levels	1,150,000	-	1,150,000
	Monitor and evaluate the performance of facilities and services and institute remedial measures where required	102,850	-	102,850
G2	Assess capacity for implementing M&E at all levels	-	-	-
	Establish/strengthen structures for effective M&E including mechanisms for DA- and community-level monitoring	650,000	-	650,000
G3	Define appropriate strategy for communicating information on M&E in collaboration with other allied institutions	60,000	-	60,000
	Ensure that relevant agencies, at all levels, provide timely and reliable data and information for tracking sector progress and contributing to periodic sector updates	150,000	-	150,000
	National Conferences	960,000		960,000
	Sub-Total M&E General Measures	2,112,850	-	3,072,850
Specific Component Measures: Solid Waste Management				
G2	Assess capacity for implementing M&E at all levels	6,000,000	-	6,000,000
	Sub-Total M&E SWM	6,000,000	-	6,000,000
	Grand Total M&E	8,112,850	-	9,072,850

5.5 Requirements for improving Levels of Service

593. The requirements for Levels of Service over the first phase of the NESSAP are for carrying out proposed activities (services and interventions) to meet set indicators under each service component measure (E1 to E5), to achieve the *minimum* ISIOs by 2015.

594. There are a number of "software" activities under Levels of Service that can be considered as part of capacity enhancement. Examples include, updating of DESSAPs (under E1) and enhancing private sector roles (under E2).

595. The measures-activities planning framework applied for projecting requirements for specific ISIOs are shown in Table 5.7.

5.5.1 Solid Waste Management

596. Based on information provided in baseline information gathered and draft DESSAPs prepared by MMDAs a number of basic parameters have been employed to generate district by district requirements for various services.

597. ***Municipal Solid Waste Collection and Transport***: for all MMDAs to meet the targets of minimum ISIOs, the estimated additional resources for increasing collection and transport is indicated in Table 5.8 below. This is based on 2008 average collection and transport coverage of 50% for Metropolitan Assemblies cities and 35% for the remaining Municipal and District Assemblies.

598. It is estimated that to meet the minimum targets for improving collection and transport services in the five largest cities (Accra, Kumasi, Takoradi, Tema and Tamale) i.e. 75% in 2010 and 85% by 2015 the following requirements are indicated:

- Provision of communal storage containers to cater for 70% -80% of the additional municipal solid waste to be generated;
- Improvements of selected container transfer stations to enhance container handling; these facilities are proposed to be provided as part of community infrastructure upgrading schemes for low-income areas;
- to meet the minimum ISIO for collection and transport, of 75% based on the existing predominant mode of collection and transportation systems it is estimated an amount of GH¢93,433,615 is required for the five largest cities over the six-year period 2010-2015.
- Municipal and District Assemblies will require estimated amounts of GH¢143,480,570 and GH¢283,768,607 respectively to reach 60% collection and transport by 2015.
- Provision of MRFs to reduce significantly the requirement of void-space annually for placement of waste assuming an average depth of 15 metres; and
- Provision of primary storage containers to gradually improve house-to-house service coverage and thus increase the number of direct-paying customers.

599. Specific to the five largest cities (Accra, Kumasi, Sekondi-Takoradi, Tamale and Tema) a vigorous programme of provision of refuse storage containers (120/240 litres) to increase house-to-house services, and to commence source-separation of biodegradable-organic-fractions (BoFs) will ease some-what the pressure on the city authorities' purses. The strategic location and construction of a number of MRFs (which will also serve as Refuse Transfer Depots) will also add to improving the productivity of Refuse Collection Vehicles (RCVs) through the reduction of round-trip travel times.

Table 5.14: Planning Framework for "minimum" ISIOs (2010-2015)

Item	Service Component Measure and Target		Description of Specific Services/Interventions
	Specific Component Measures: Solid Waste Management		
1	E3	Develop and ensure provision of programme for incremental coverage of, and access to services to meet increasing population and growing economy Minimum targets of collection and transport in five largest cities · 75% in year 2011; · 85% in year 2015; Minimum targets of collection and transport , for all other district capitals · 60% in year 2015;	Delivery of mix of typical collection and transport modes of services appropriate for the various housing segments (Table 5.2) to meet minimum targets
2	E2	Ensure acquisition of appropriate sites for treatment and disposal facilities (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) using participatory principles including SEA	MMDA resources for for treatment/disposal sites to meet capacity thresholds of appropriate facilities (Table 5.5 - Phasing of ISIOs for Landfills)
		Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards	Development of treatment and disposal facilities according to standards (Table 5.5)
3	E3	Provide services and facilities for primary separation of solid wastes at household, community, public levels and commercial areas · 10% by 2013 · 25% by 2015	Delivery of collection/transport services incorporating source separation as per standards (Table 5.2) and MSW Material Recovery Facilities (Table 5.6)
	Specific Component Measures: Excreta Management		
4	E2	Ensure acquisition of appropriate sites for treatment and disposal facilities (waste stabilisation ponds, trickling filters, septage treatment plants, biodigesters etc.) using participatory principles including SEA	MMDA resources for treatment/disposal sites to meet capacity thresholds of appropriate facilities (Table 5.7 - Types of Excreta Disposal/Treatment Technologies, section G.). Co-sitting of MRFs is recommended
		Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards	Development of treatment and disposal facilities according to standards (Table 5.7)
	E3	Ensure adequate systems for managing wastewater treatment, re-use and disposal	Development of treatment and disposal facilities according to standards (Table 5.7) - with emphasis on harvesting of bio-gas (e.g. bio-digestion)
	Specific Component Measures: Storm Water Drainage and Sullage Conveyance		
5	E3	Ensure adequate systems for managing storm water drainage and sullage conveyance · Develop Drainage Development Plans (DDPs) for all Regional Capitals by 2012 · Develop DDPs for all District Capitals by 2015 · Implement First-round sub-projects of DDPs beginning 2012	
		. Implement pro-poor improvements in low-income communities	provision of stone-pitched/concrete lined secondary/tertiary drains 450/600¢ mm in selected low-income communities
	Specific Component Measures: Health-care Facility Waste Management (HCFWM)		
6	E1	· Ensure implementation and operation of proper Health-care waste management systems and facilities · Full compliance by 100% Regional and Specialist Hospitals with guidelines by 2013 • Full Compliance by 50% District Hospitals by 2015	Install appropriate facilities including biodigesters (Table 5.8: ISIOs for Managing HCF Wastes)

600. ***Improving Primary Storage and Pilot Source Separation Scheme***: the vigorous provision of primary storage containers at household level for middle-upper and high income areas is very critical for improving services towards "comfortable" level and also lay the foundation for source (primary) and secondary separation of refuse as part of measures under 4Rs and the vision for "MINT".

601. An estimated amount of GH¢67,000,000 is required to reach 15% of targeted households by 2015. Linked to the pilot source-separation scheme is the implementation of a number of Value-Chain Enterprises as part of the Youth Engagement in Service (YES) delivery programme.

602. ***Sweeping of Streets and Public Places (Central Business Districts, Taxi/Bus/Lorry Terminals, Markets, etc.)***: in the absence of ISIOs and/or standard rates, the requirements for these activities are based on estimates derived from assessment of prevailing practice employed as part National Youth Employment Programme's (NYEP) Waste and Sanitation Module.

603. It is planned that over the 6 year period, an amount of GH¢7,459,200 will be required to cover cleansing/sweeping of public places and streets of equivalent length as shown in the Table 5.15.

Table 5.15: Requirements for Sweeping /Cleansing of Selected Public Streets and Spaces

MMDA – Category	No.	Length of Streets (km)	Cost per year	Total
District	140	5	588,000	3,528,000
Municipal	24	10	201,600	1,209,600
AMA (Sub-Districts)	11	25	231,000	1,386,000
KMA (Sub-Districts)	10	15	126,000	756,000
Sek-Tak (Sub-Districts)	4	10	33,600	201,600
Tamale (Sub-districts)	3	10	25,200	151,200
TMA	1	25	21,000	126,000
Cape Coast	1	20	16,800	100,800
			1,243,200	7,459,200

604. An additional amount of GH¢5,820,000 will be required to provide GH¢5,000 per district per annum for replacement/repairs of cleansing tools and equipment.

605. ***Cleaning of Beaches and Shores***: an indicative lump sum of GH¢1,800,000 (GH¢60,000 per MMDA) is applied to enable 30 MMDAs along the coast lines as well as those with shores along major rivers and lakes, to install a number of community-amenity improvement facilities. This activity is designated as part of Community-Amenity Improvement Programme (CAIP) and will be carried out as part of the on-going Eco-brigade programme.

606. ***Mining (evacuation) of Large Refuse Dumps in Small, Medium and Large Towns***: as part of initial measures towards improving the community-amenities and also lay the basis for attaining minimum services at disposal sites, one-time mining[40] of large unauthorized and open crude-dumps is proposed. An estimated amount of GH¢6,271,500 is required for mining of old dumps in 24 Municipal and 50 District Assemblies.

607. ***Material Recovery (and Treatment) Facilities***: considering the current practices at the disposal sites and the inability of the five largest cities to meet operational requirements

[40] The evacuation of large refuse dumps in Accra and Kumasi carried out as part of the Priority Works Project (PWP), 1989 – 1991, managed by Technical Services Centre (TSC) of the then Ministry of Works and Housing served as a useful pre-cursor to next stage urban projects and provided much needed jobs for small works contractors.

for engineered (sanitary) land filling (even for cities where these have been provided at very high costs like Kumasi and Tamale) it is proposed that, based on the Minimum ISIOs of Table 5.5 and Table 5.6, measures are implemented to meet the requirements for Improved Dumping (ID) Mechanised for all disposal operations of capacity of more than 20 tonnes per day and Improved Dumping (ID) Manual for those below, during this first phase of the NESSAP.

608. In all cases the MRF requirements of Table 5.16 will be implemented. For large disposal site (more than 250,000 contributing population), the basic principles of bio-reactor landfilling with landfill gas extraction will be implemented.

609. The investments for implementing ID (Mechanised) and ID (Manual) operations and the related operation and maintenance costs, in Table 5.16, are derived from investment and cost functions to meet the basic requirements stipulated in the Ghana Landfill Guidelines, 2002.

Table 5.16: Investment and O&M for Minimum ISIO for Landfills

Type	Population Threshold	Type of Operation	Investment Cost(GH¢)/tonne (life-time: 10years)	O&M Cost (GH¢) (per/yr)
Metropolitan	> 250,000	ID-Mech., Bio-reactor	5.3	6.8
Municipal	95,000 - 250,000	ID-Mech., Bio-reactor	5.5	7
Large Urban	40,000 - 95,000	ID-mech.	7.5	8.6
Small Urban	15,000 - 40,000	ID-manual	7.0	9.9
Large Rural	5,000 - 15,000	ID-manual	3.0	5.1
Small Rural	< 5000	ID-manual	2.5	5

610. Over the past two (2) years the private sector has intervened to partially bring under control the looming crisis faced by the capital city, Accra due to the inability of the city authority (AMA) to provide a disposal site. Currently there are 3 privately- owned and operated facilities in Accra. Tipping fees at these sites add to the costs[41] borne by the AMA and thus the MLGRD.

611. Over the planning period it is proposed that four (4) units of Metropolitan, twelve (12) units of Municipal and seventy-six (76) of Large-urban type of Improved Dumping (ID) Mechanised facilities will be constructed. These will serve GAMA, selected municipalities and urban council towns of district assemblies. An estimated cost of GH¢107,602,322 is earmarked for this intervention.

612. The effective operation of all disposal sites as Material Recovery Facilities (MRFs) is a core strategy for realising the 4Rs objective of the revised policy which in turn satisfies the "MINT" philosophy of the NESSAP. There is need to invest along all the component functions of environmental sanitation if this is to be achieved.

613. In order to meet the policy measure of "*integrating activities of 'scavengers[42]' in improved waste collection, transfer and treatment and disposal facilities*" a value-chain analysis of the environmental sanitation sector will be carried out and specific *component/product* value-chain enterprises supported. Value-pickers will be sensitised on health and safety issues.

614. During this first phase an amount of GH¢24,250,000 is estimated in support of value-chain enterprises over the next 5 years. This programme is earmarked for

[41] Tipping charges = GH¢12 per tonne. This charge corresponds to an ID (Mechanised) facility although site infrastructure and operations at these sites are substandard.
[42] In the Material-In-Transition, 'MINT' philosophy these are *value-pickers* not 'scavengers'.

implementation as part of the Youth Engagement in Service (YES) delivery programme and will also target employment of individual value-chain actors.

615. Further to the above, the establishment of ***Waste Electrical and Electronic Equipment*** (WEEE) collection and handling centres[43] by the private sector will be an important aspect of value-chain enterprise development. It is envisaged that five (5) WEEE centres will be established in Accra, Tema (Southern zone), Kumasi (middle zone), Takoradi (Western/Central) and Tamale (Northern zone) within the next five (5) years.

616. ***Recycling plants (stations)***: in line with the ISIOs for Solid Waste Collection and Transport and MRFs it is expected that many more recycling stations will be established to gradually meet the target of one recycling plant serving about 150,000 people in large municipal catchment areas. Due to the variation in the capacity and waste-types that can be considered for recycling no unit costs are provided.

617. ***Composting plants***: installation of windrow composting plants as part of MRFs is to reduce the transport cost of input-material to stand-alone plants. The target is to compost 50% of biodegradable organic fraction (BOF) of the proportion of municipal refuse that will be source separated (i.e. 15% by 2015).

618. The capacities of compost plants that will be installed to correspond to the minimum ISIOs for MRFs and the estimated costs are indicated in Table 5.17.

Table 5.17: Investment and O&M Costs for Compost Plants (Corresponding to MRFs)

Type of Landfills/MRFs	Compost Facility Capacity (tonnes/day)	Type Operation	Investment Cost(s), GH¢	O&M Cost (per/tonne), GH¢
Metropolitan	250	Windrowing, Mechanised	3,531,669	32
Municipal	200	Windrowing, Mechanised	2,648,752	36
Large Urban	150	Windrowing, Semi-Mechnised	1,750,000	20
Small Urban	80	Windrowing, Manual	50,000	7.5
Large Rural	3.5	Windrowing, Manual	35,000	5
Small Rural	2	Windrowing, Manual	15,000	3.5

619. It is expected that within the planning period, at a minimum, four (4) mechanised compost plants will be installed in metro areas; six (6) in selected municipal assemblies; and fifteen (15) model compost plants of varying capacities (150, 80, 5, and 2 tonnes) and operation-modes (mechanised/manual) in the one hundred and forty (140) District Assemblies across the country. It is estimated that the private sector and MMDAs will invest about GH¢57,769,580 over the first phase of implementing this important element of the NESSAP strategy of MINTing.

[43] The typical costs of WEEE collection and handling centres are currently not available. These vary depending on the materials handled.

5.5.2 Excreta (Liquid Waste) Management

620. During this phase, remedial actions will focus on two areas; (i) improving access to improved household-level and (ii) installation of final treatment and disposal, facilities. In both cases focus will to effectively derive value through re-use and recovery materials in fulfilment of "MINT" philosophy.

621. Firstly, implementing an effective country-wide programme to overcome the over reliance on public toilets in low-income urban communities and the resort to open-defaecation in many rural, small/large towns and peri-urban settlements due to lack of improved facilities.

622. Where shared facilities are provided in compound houses (the main housing segment in low-income areas and indigenous settlements of rural, small and large towns) their adequacy is in question[44] and indicates the need for further efforts for upgrading existing facilities and expanding options.

623. Secondly, is to significantly reduce the un-controlled discharge of untreated faecal sludges and septage into rivers, the sea as well as on and close to refuse dumps. The burden of diseases such as cholera, dysentery and typhoid due to these poor practices warrants urgent attention and the MTDPF recommended the installation of final treatment facilities.

624. The reliance of on-plot WC/septic tanks in newly built estates and developing areas (which are growing rapidly) also places a burden for effective treatment of septage.

625. Related to the above is to institute improved operation and maintenance management arrangements to overcome the common practice of running down newly-installed facilities such that within the first and second years after commissioning they deteriorate and fall into disrepair sometimes beyond rehabilitation.

626. ***Increasing Access to Improved Household Sanitation Facilities***: following on from section 5.3.1.2, the implementation of CLTS as part of *enabling element* is expected to enhance accelerated coverage for home latrines to meet the needs of different housing segments at different rungs of the *sanitation ladder*.

627. While the initial focus of CLTS initiatives will be on rural areas, related strategies that will trigger large scale and sustainable behavioural change and increased household ownership of sanitation facilities in small, large towns will be implemented. The intractable challenge of provision of household latrines, particularly in low-income houses will be addressed through previously tested revolving fund (loan) schemes.

628. The enhanced presence and operations of Micro-Finance-Institutions (MFIs) and Rural Community Banks (RCBs) over the past few years will be relied upon to implement micro-credit schemes targeting, initially, households with women as heads of families and community-based women associations.

629. The micro-finance institutions will serve as finance management-intermediaries to manage the credit schemes to households. Small works contractors and artisans will receive training for promotion and marketing all the available improved technology options.

630. Existing organizations including Water and Sanitation Development Boards (WSDBs), Water and Sanitation Committees (WATSANs), Community-based Organisations (CBOs), landlord associations, market-women associations etc), will serve as platforms for promoting the scheme.

[44] WHO/UNICEF JMP for WSS. Progress on Drinking Water and Sanitation: Special Focus on Sanitation, 2008 indicates 51% of coverage of Shared as against 10% of "improved" facilities.

631. An estimated amount of GH¢125,000,000 is earmarked for supporting the provision of 25,000 facilities per year over the initial phase, including appraisal/assessment of activities/capability and roles of MFIs/Rural Banks act as MIs for rolling out country-wide home-toilet improvement programme employing concessionary revolving-loan scheme.

632. ***Provision of Treatment, Re-Use, Recovery and Disposal Facilities***: to meet these requirements while adhering to prescribed standards including the preparation of Environmental Impact Assessments, the co-siting of new facilities as part of MRFs will be pursued, as far as practicable; the land required for these are estimated as part of requirements for MRFs (see Table 5.5).

633. The provision of improved treatment and re-use facilities will target selected district capitals, growth and market centres across the 76 urban councils in the country. An estimated amount of GH¢13,000,000 is earmarked for the provision 15 systems comprising FSTP/Bio-digesters, simplified sewerage networks cum waste stabilisation ponds over 6 years.

634. An important aspect of these activities will be the installation of decentralised-excreta-treatment-resource-recovery and re-use (DETERRR) systems in strategic locations. Over the initial period the installation of 50 of such decentralised communal facilities at an estimated cost of GH¢7,525,000 is proposed; this is expected to reduce the burden of faecal sludge and septage flows to treatment facilities.

635. The above intervention implemented together with those under SWM is intended address the need "*to provide adequate targeted services in areas close to wetlands, water courses and other vulnerable water resources prone to waste-abuse*".

636. An important aspect of this strategy will be the involvement of the private sector in the provision and management of the DETERR facilities similar to existing franchise management arrangements.

637. ***Rehabilitation, Upgrading, Installation and Improved Operation-and-Maintenance Management of Existing Treatment Facilities***: the NESSAP proposes the implementation of a number of Technical Assistance and Technology Transfer (TATT) projects to overcome the rampant "operational-value" stripping of treatment facilities.

638. The rehabilitation of the main treatment plant serving the capital, Accra, and its environs (GAMA, Greater Accra Metropolitan Area[45]) has engaged city authorities and ministries in recent times. The closure of the Teshie and Achimota septage treatment facilities has increased the volume of discharges at the Korle-Gonno tipping station and requires urgent repair and upgrading of the Accra Central Sewerage Treatment Plant (Upflow-Anaerobic Sludge Blanket, UASB, system) as well as a number of plants within GAMA to remedy the situation. The rehabilitation of a number of disused plants in other MMDAs will also be initiated.

639. An estimated amount of GH¢13,400,000 is earmarked for rehabilitation, upgrade and installation of treatment facilities in GAMA, TMA, AMA, STMA, TAMA areas. An additional estimated amount of GH¢3,850,000 will be required to implement effective operation and maintenance management of facilities through municipality-cum-private-sector led TATT initiatives.

640. ***Implementation of Pro-Poor Initiatives in Low-in Income communities***: installation of improved sanitation facilities in schools and their sustainable management will be carried out as part of pro-poor upgrading schemes. Over the period an estimated amount of GH¢73,200,000 is earmarked for provision of 2,910 facilities for existing

[45] GAMA covers AMA, TMA, Ledzorkuku-Krowor, Adentan and Ashaiman municipalities, Ga-West, Ga-East, and Ga-South districts.

basic schools in rural, small and large towns as well as in low-income urban communities. This will be in addition to the provision of school toilets for new schools under Government of Ghana's accelerated programme to replace *schools under trees*[46].

5.5.3 Stormwater Drainage and Sullage Conveyance

641. Based on the ISIOs for drains, interventions are based on implementing simple drainage improvement plans over the period.

642. Over the period it is planned that MMDAs with the support of HSD-MWRWH will complete the development of Drainage Development Plans DDPs) for all regional capitals and districts capitals at estimated costs of GH¢75,000 and GH¢225,000 respectively.

643. ***Pro-Poor Improvements in Low-Income Urban Communities***: as part of improving aesthetic amenity of communities an amount of 8,500,000 is earmarked for provision of 2km of 450/600 mm diameter for fifty (50) selected communities over the next 5 years.

644. ***Cleansing of Communal Drains***: this aspect of drain cleansing constitutes one of the major challenges of improving the community-amenity of low-income communities. Cleansing and maintenance of drains (even if unlined) with community involvement and the engagement of local youth is therefore an important element of behavior change strategies to be adopted in this phase.

645. An amount of GH¢24,384,000 is to be allocated for the cleansing of drains in selected low-income communities. This will cover for each District Assembly, 2 km per district capital and each urban council. For Municipal Assemblies 2.5 km per municipal capital and each urban council[47]. For the four (4) Metropolitan Assemblies that have Sub-metropolitan District Councils provision for 5km of drains per sub-metro. Provision is made for 10 km each for the two (2) single-town metropolis of Tema and Cape Coast.[48] The engagement of youth for drain cleansing within the Community Amenity Improvement Programme (CAIP) will be implemented on a pilot basis.

Table 5.18: Requirements fot Community Drain Cleansing as part of CAIP

Location		No.	Length of Drain (km)	Cost per Year (GH¢)
DISTRICT	DA Capital	101	2	1,939,200
	Urban Council	23	2	441,600
MUNICIPAL	MA Capital	13	2.5	312,000
	Urban Council	27	2.5	648,000
METROPOLITAN	AMA (Sub-Districts)	11	5	528,000
	KMA (Sub-Districts)	10	5	480,000
	Sek-Tak (Sub-Districts)	4	5	192,000
	TAMA (Sub-districts)	3	5	144,000
	TMA	1	10	96,000
	Cape Coast	1	10	96,000
				4,876,800

[46] It is reported that there are 3,947 Schools-under-Trees in Ghana, 600 has been replaced with classroom buildings by 2010
[47] There are 76 Urban Councils, out of which 50 are district/municipal capitals.
[48] Tema and Cape Coast have been upgraded to Metropolitan Assembly status.

5.5.4 Health-Care Facility Wastes

646. As indicated in the ISIO for Managing Health-Care Facility (HCF) wastes, special hospital wastes will be handled according to Policy and Guidelines on Health-Care Facility Wastes issued by the Ministry of Health.

647. The proposed NESSAP interventions focus on effective treatment of bio-medical wastes, wastewater (sewage) and bio-degradable organic fraction (BOF) of municipal-type solid waste (where practicable) with harvesting of bio-gas and re-use of treated wastewater. It is proposed that all regional-level/specialist and 50% of district hospitals meet this requirement with the installation of bio-digesters by 2013 and 2015 respectively.

648. An estimated amount of GH¢1,469,275 is earmarked for the installation of these facilities at regional and specialist hospitals. The estimated amount to meet installation for 50% district hospitals is GH¢1,231,935. When this is implemented these HCFs will reach the comfortable level of service for Category 2 and 3 wastes.

649. The cost for targeted regional and specialist facilities is shown in Table 5:19.

650. Due to the anticipated high potential for bio-gas harvesting and utilization it is proposed that EPA/MEST and the MoH provide the necessary administrative facilitation through the MoFEP to implement the proposed interventions as part of Carbon-Development Mechanism facility for earning CO_2 credits.

Table 5.19: Estimated Costs for Bio-gas Plants and Accessories at Selected Regional HCFs

Name of Facility	Region	Capacity (No. Beds)	Capacity of Plant (m^3)	Estimated Cost (GH¢)
Cape Coast Regional	Central	228	35	63,450
Sunyani Regional	Brong Ahafo	150	50	83,700
Koforidua Regional	Eastern	247	50	77,700
Ridge	Greater Accra	162	45	76,950
Tema General	Greater Accra	270	100	151,200
Pantang Psychiatric	Greater Accra	450	90	137,700
Accra Psychiatric	Greater Accra	343	200	292,200
Volta Regional	Volta	50	7	19,375
Tamale Regional	Northern	370	50	83,700
Bolga Regional	Upper East	189	30	56,700
Wa Regional	Upper West	189	30	56,700
KATH	Ashanti	854	200	286,200
Effia-Nkwanta	Western	330	50	83,700
			Total	**1,469,275**

651. Table 5:20 gives a breakdown of costs for implementing the activities to meet the key measures of Levels of Service described under section 5.5.

5.5.5 Summary of Costs for Enabling Elements and Levels of Service

652. Table 5.21 presents a summary of the requirements for both *enabling elements* and *Levels of Service*. As indicated a total sum of GH¢1,022,186,415 is required to implement the first-phase of the NESSAP over 2010 – 2015.

653. The costs of Table 5.21 are based on the activities/measures defined for each focus area of the NESSAP. There are several alternatives for defining the implementation programmes. Those considered include:

- Defining programmes according to the main NESSAP component-measures:- *general* (or cross-cutting issues), *solid waste management*, *excreta management*, *storm-water drainage* and *sullage conveyance*, *environmental sanitation education and enforcement management*, and *health-care, industrial and hazardous wastes management*;
- Identifying implementation programmes to reflect various national-plan targets including MDGs; and/or
- Defining implementation plans according to the NESSAP framework for improving environmental sanitation in combination with the above.

654. The last alternative was adopted and implementation programmes defined to address sector requirements. The programmes will be implemented through MMDA/MLGRD interventions as well as those of related sectors such MWRWH, MoE, MEST, MoH and MoFA. These are elaborated in Chapter 6.

Table 5.20: Costs for Implementing Measures for Levels of Service

Table 4.5 Focus Area: E Levels of Service				
General Measures				
Obj No.	**Measure**	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
E1	All MMDAs shall prepare District Environmental Strategy and Action Plans (DESSAPs)			
	. Regional Workshops on DESSAPs	200,000		200,000
	. Selected Districts for specialist support	150,000		150,000
	All MMDAs shall update District Environmental Strategy and Action Plans (DESSAPs) every 4 year in line with MTDP	425,000		425,000
	MLGRDE shall prepare a National Environmental Sanitation Strategy and Action Plan (NESSAP) based on DESSAPs	-		-
	MLGRDE shall update the National Environmental Sanitation Strategy and Action Plan (NESSAP) based on DESSAPs every 4 years	70,000		70,000
	Sub-Total General Measures	845,000	-	845,000
Specific Component Measures: Solid Waste Management				
E1	Ensure that services meet the needs of specific target groups including vulnerable people, women and children, and the poor			
	. Implement pro-poor improvements in low-income communities	-	725,000	725,000
	Ensure that sites for treatment and disposal of wastes (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) are located so as not to create safety and health hazards or aesthetic problems in the surrounding area	-	-	-
E2	Ensure that development and sitting of communal storage and transfer depots, treatment and disposal facilities conform to statutory land-use norms and regulations	41,450		41,450
	Ensure acquisition of appropriate sites for treatment and disposal facilities (landfills, composting facilities, waste stabilisation ponds, trickling filters, septage treatment plants, etc.) using participatory principles including SEA			
	Metropolitan, contributing population >250,000			3,784,849
	Municipal, contributing population 95,000 - 250,000			9,845,676
	Large Urban, contributing population 40,000 - 95,000			
	Small urban, contributing population 15,000-40,000			
	Small/Large Rural, contributing population <15,000			
	Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards including the preparation of Environmental Impact Assessments			
	Metropolitan, contributing population >250,000			14,159,546
	Municipal, contributing population 95,000 - 250,000			21,399,505
	Large Urban, contributing population 40,000 - 95,000			72,043,271
	Small urban, contributing population 15,000-40,000			
	Small/Large Rural, contributing population <15,000			
E3	Develop and ensure provision of programme for incremental coverage of, and access to services to meet increasing population and growing economy			
	Minimum targets of collection and transport in five largest cities			
	· 75% in year 2010;			-
	· 85% in year 2015;	93,433,615	-	93,433,615
	· 100% in year 2020.			
	Minimum targets of collection and transport , for all other districts			
	· 60% in year 2015; municipalities(top row) and districts (bottom row)	143,235,394	-	143,235,394
		282,540,759	-	282,540,759
	· 75% in year 2020;			
	· 100% in year 2025.			
E3	Provide services and facilities for primary separation of solid wastes at household, community, public levels and commercial areas			
	• 20% by 2015	66,666,667		66,666,667
E4	Identify all environmentally sensitive areas such as wetlands and water courses prone to impact from waste-abuse	-		-
	Provide adequate targeted services in areas close to wetlands, water courses and other vulnerable water resources prone to waste-abuse	-		-
	. Provision of Street and Public Places Sweeping/Cleansing & Litter Storage Bins	7,459,200	5,820,000	13,279,200
	. Cleansing of Communal Drains	24,384,000	-	24,384,000
	. Cleansing of Beaches and shores	-	1,800,000	1,800,000
	. Minning (Evacuation) of large refuse dumps in small, medium & large towns	6,271,500	-	6,271,500
E5	Develop mechanisms for integrating the activities of 'scavengers' in improved waste collection, transfer, treatment and disposal facilities			
	. Development of VC Entreprises and YES module	75,000	24,250,000	24,325,000
	. Installation of compost facilities	-	57,769,184	57,769,184
	. Installation of Recycling facilities	-	-	-
	WEEE Facilities	-	15,000,000	15,000,000
	Sub-Total Levels of Service SWM	624,107,585	105,364,184	850,704,616

Table 5.21: Costs for Implementing Measures for Levels of Service (Cont'd)

Obj No.	Measure	COSTS		
		RECURRENT (O&M)	CAPITAL	TOTAL
Specific Component Measures: Excreta Management				
E1	Ensure that the bulk of environmental sanitation services shall be provided by the private sector under regulation by the public sector agencies	3,850,000	13,400,000	17,250,000
	MMDAs shall maintain adequate capacity to intervene and provide the services in the event of failure of the private sector to deliver services due to industrial actions in their establishments or other reasons	-	-	-
	Ensure that services meet the needs of specific target groups including vulnerable people, women and children and the poor	-	-	-
	. Implement pro-poor improvements in low-income communities (school sanitation facilities)	-	73,200,000	73,200,000
E3	Ensure that treatment and disposal facilities are provided and used in accordance with prescribed standards including the preparation of Environmental Impact Assessments	-	13,050,000	13,050,000
	Ensure adequate systems for managing wastewater treatment, re-use and disposal	25,000	7,500,000	7,525,000
E5	Ensure adequate options of facilities are available for all segments of the population especially vulnerable and physically challenged persons	-	50,000	50,000
	. Provide seed for revolving fund for country-wide home-latrine promotion targeting low-income communities of urban, large and small towns using identifiable groups and MFIs		125,000,000	125,000,000
Sub-Total Levels of Service Excreta Management		3,875,000	232,200,000	236,075,000
Specific Component Measures: Storm Water Drainage and Sullage				
E3	Ensure adequate systems for managing storm water drainage and sullage conveyance			
	· Develop Drainage Development Plans (DDPs) for all Regional Capitals by 2012	75,000	-	75,000
	· Develop DDPs for all District Capitals by 2015	225,000	-	225,000
	• Implement First-round sub-projects of DDPs beginning 2010	-	-	-
	. Implement pro-poor improvements in low-income communities	-	8,500,000	8,500,000
Sub-Total Levels of Service Drainage and Sullage		300,000	8,500,000	8,800,000
Specific Component Measures: Health-care, Industrial and Hazardous				
E3	• Ensure implementation and operation of proper Health-care waste management systems and facilities			
	· Full compliance by 100% Regional and Specialist Hospitals with guidelines by 2013	-	1,469,275	1,469,275
	· Full Compliance by 50% District Hospitals by 2015	-	1,231,935	1,231,935
Sub-Total Levels of Service HCFW Management		-	2,701,210	2,701,210
Grand Total Levels of Service		629,127,585	348,765,394	1,099,125,826

Table 5.22: Summary Costs for Implementing Measures (2010-2015)

Focus Area		TOTAL COSTS (GH¢)
Enabling Elements	Capacity Development	138,406,620
	Information, Education & Communication	1,275,500
	Legislation & Regulation	8,337,000
	Financing and Cost Recovery	403,955
	Research & Development	636,170
	Monitoring & Evaluation	9,072,850
	Levels of Service + Prg. Support	1,159,528,992
	GRAND TOTAL	**1,317,661,087**

6 Implementation Plan

6. Implementation Plan

655. The implementation plan for the NESSAP is designed to meet underlying themes of the framework for environmental sanitation (Figure 6.1) and also cover all the focus areas discussed in the previous chapter. This is achieved by defining implementation packages (programmes) for improving *enabling elements* and *Service Levels* so immediate-, short- to medium term strategies are addressed while ensuring effective *sector coordination*, *collaboration* and *partnership-building*.

656. The implementation plan also recognises as key the provisions of the Local Government Law, 1993 (Act 462) and the Local Planning System 1990, (Act 480) and the various planning guidelines issued by the National Development Planning Commission (NDPC). The operationalisation of plan elements is expected, as far as practicable, to take place at the decentralized level by MMDAs. Figure 6.1 shows the implementation tiers for the NESSAP and its related documents SESIP and the foundational documents, DESSAPs.

6.1 Implementation Packages

657. Based on the above considerations four (4) main programmes are defined. Three (3) programmes (institutional development; community participation and public awareness; research, monitoring and governance) fall under *enabling elements* and one (1) programme (Local Services Improvement) under *Levels of Service*.

6.1.1 Institutional Development and Capacity Enhancement Programme

658. This component of the implementation plan is for capacity development of the environmental sanitation sector, particularly those activities that when carried out within the short- to medium-term will have immediate impact on how sector staff will be enabled to provide the necessary facilitation and oversight of planned activities and interventions.

659. The main activities are shown in Table 6.1. The activities cover all the measures under capacity development and "General Measures" of Levels of Service.

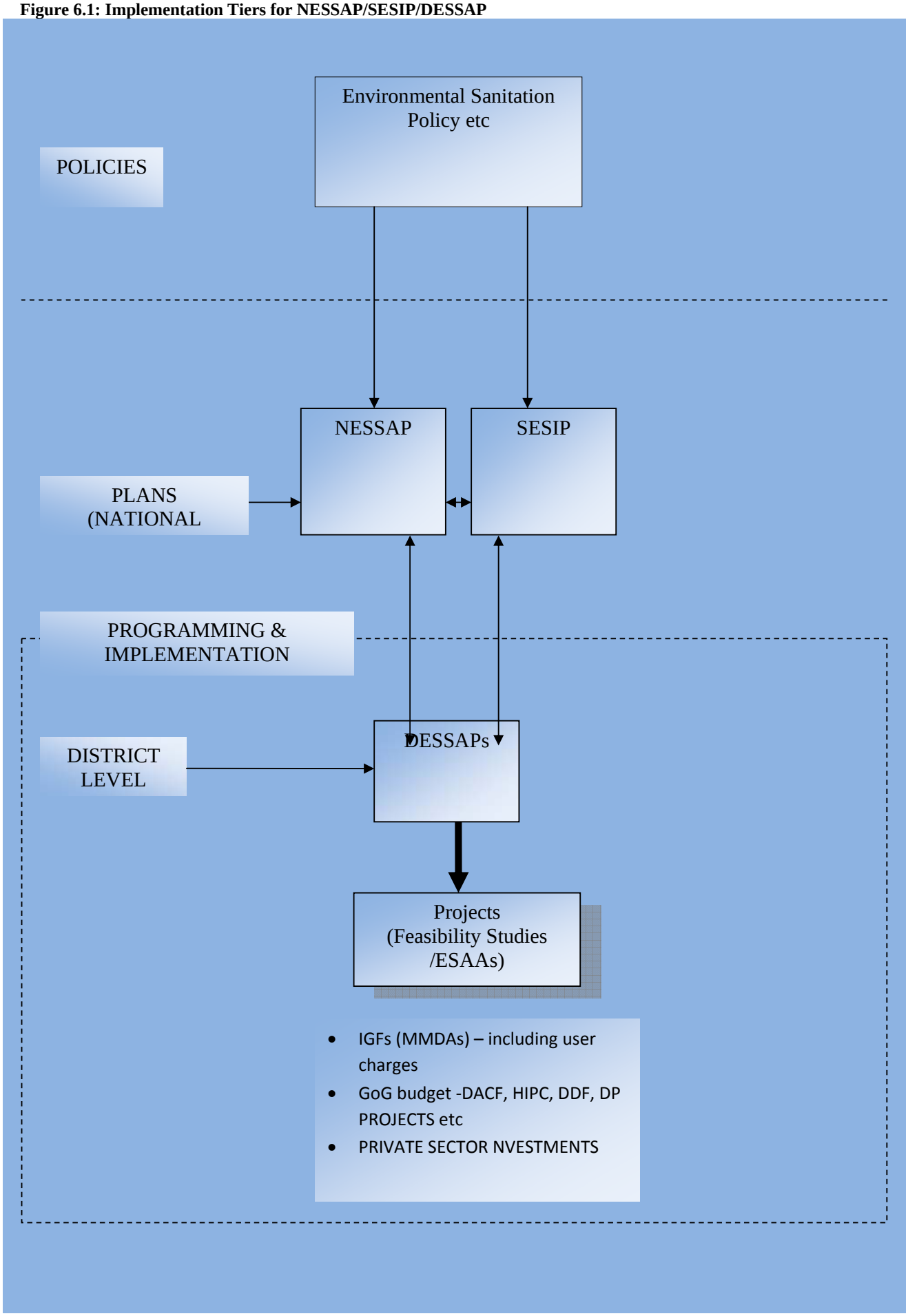
Table 6.1: Institutional Development and Capacity Enhancement Programme (2010-2015)

Item	Activity Description	Implementation Schedule (Yrs)						Estimnated Cost
		1	2	3	4	5	6	(GH¢)
1	Institutional Strengthening of EHSD/REHSUs							5,477,500
2	Upgrading of Schools of Hygiene							2,571,000
3	Specialised Training Programmes & Courses							4,267,500
4	Services Improvement Support (Consultacies, Evaluations, Appraisals & Updates)							1,025,120
5	Provision of Equipment, Tools and Machinery							1,800,000
	TOTAL							15,141,120

6.1.2 Community Participation and Public Awareness Programme

660. This programme focuses mainly on behavioural change communication and social marketing issues to meet the awareness raising theme of the framework for

Figure 6.1: Implementation Tiers for NESSAP/SESIP/DESSAP



environmental sanitation. It is central to achieving the ISIOs for local services including household latrine promotion and improved refuse collection and management.

661. Activities cover *Environmental Sanitation Education (*covering all aspects of Information, Education and Communication, IEC), and *Enforcement Management (*comprising Legislation and Regulation*)*. Activities include re-introduction of ESICOME with appropriate modifications to cater for CLTS.

662. Programme implementation will be carried out to ensure synergy with other sanitation and hygiene education initiatives such as those under SHEP and CWSA.

663. The key activities are indicated in Table 6.2.

Table 6.2: Community Participation and Public Awareness Programme (2010-2015)

Item	Programme Activity	Implementation Schedule (Yrs)						Estimnated Cost
		1	2	3	4	5	6	(GH¢)
1	Behavioral Change Communication & Public Campaings							350,000
2	CLTS (National Outreach)							124,177,500
3	Dissemination of Policies, Standards, etc							746,575
4	Support to NGOs, CBOs & Traditional Authorities							60,000
5	Enforcement Management for Services Improvement							8,226,000
6	Support to Promotion of Programmes, Projects & Products							100,000
	TOTAL							133,660,075

6.1.3 Local Services Improvement Programme

664. This programme essentially covers activities for reaching "minimum" ISIOs during the first phase of the NESSAP. It covers the various services as indicated in Table 6.3[49]. The details of the programme activities are indicated in Table 6.4.

6.1.4 Research, Performance Monitoring and Governance Programme

665. The Research, Performance Monitoring and Governance Programme (RPMGP) indicates activities for the remaining focus areas of *Financing and Cost Recovery*, *Research and Development*, and *Monitoring and Evaluation* as well as requirements for overall plan management. The activities include implementing results-based M&E as well as linking performance-based-resourcing to other sector programmes such as FOAT/DDF.

666. The issues of sector coordination, collaboration and partnership arrangements with development partners (DPs) are also covered under this programme. The details of programme activities are presented in Table 6.4.

667. The LSIP Management Support component will cover management support costs incident on the EHSD and REHSU and regional collaboration institutions for facilitating incremental MMDA operations.

6

[49] "software" issues such as "update of DESSAPs" are placed under the Institutional Development and Capacity Enhancement Programme.

Table 6.3: Local Services Improvement Programme (2010-2015)

Item	Component	Programme Activity	Implementation Schedule (Yrs)						Estimnated Cost
			1	2	3	4	5	6	(GH¢)
1	Solid Waste Management	Improving Municipal Refuse Collectioon and Transport							519,209,769
		Pro-Poor Improvement Programme							725,000
		House-to-House Improvement & Pilot Source-Separation Scheme							66,666,667
		Street and Public Cleansing							13,279,200
		Cleansing of Beaches & Shores (CAIP)							1,800,000
		Mining of Large Refuse Dumps							6,271,500
		Acquisition of Land for final Disposal Sites (MRFs)							13,630,525
		MRF - Improved (Mechanised) Disposal Sites							107,602,322
		Establishment of WEEE res & Value-Chain Entreprises (YES Programme)							39,325,000
		MRF-Recycling Plants							-
		MRF-Compost Plants							57,769,184
		SUB-TOTAL							**826,279,166**
2	Excreta Management	Increasing Access to Improved Household Sanitation Facilities							125,050,000
		Provision of Treatmen/Disposal Facilities & DETERR Systems							20,575,000
		TATT Schemes							17,250,000
		Pro-Poor School Sanitation Programme							73,200,000
		SUB-TOTAL							**236,075,000**
3	StormWater & Sullage Conveyance	Drainage Development Plans							300,000
		Pro-Poor Drainage Improvement Scheme							8,500,000
		Cleansing of Communal Drains (CAIP)							24,384,000
		SUB-TOTAL							**33,184,000**
4	Health-Care Facility Wastes Mgt.	Installation of Biogas Plants and Utilization Accessories (Regional & Specialist HCFs)							1,469,275
		Installation of Biogas Plants and Utilization Accessories (District HCFs)							1,231,935
		SUB-TOTAL							**2,701,210**
		TOTAL (LSIP)							**1,098,239,376**

Table 6.4: (Research, Performance Monitoring and Governance Programme (2010-2015)

Item	Programme Activity	Implementation Schedule (Yrs)						Estimnated Cost
		1	2	3	4	5	6	(GH¢)
1	Research & "MINT" Products Development							811,170
2	Environmental Sanitation Assessment & Audits (ESAAs)							6,000,000
3	Improvement of Local Finance Mgt.							333,330
4	R-Based M&E							1,962,850
5	Joint Monitoring and Performance Reviews /(NESCON)							1,110,000
	Sub-Total							10,217,350
6	LSIP Management Support							60,403,166
	TOTAL							70,620,516

668. The LSIP Management Support cost also includes costs for establishing the proposed NESIMBOD instruments proposed for the effective implementation of the accompanying SESIP.

669. The programme summary for the implementation packages is shown in Table 6.5.

Table 6.5: Summary of Implementation Packages (2010-2015)

Item	Implementation Package (Programme)	Estimnated Cost (GH¢)
1	Institutional Development & Capacity Enhancement	15,141,120
2	Community Participation and Public Awareness Programme	133,660,075
3	Local Services Improvement Programme	1,098,239,376
4	Research, Performance Monitoring and Governance Programme	70,620,516
	TOTAL	1,317,661,087

6.2 Institutional Arrangements

670. The arrangements required for effective implementation and management of the NESSAP as well as issues of intra- and inter-sector harmonisation and alignment follow the underlying principles of Section 4.4 and the statutes governing decentralized management.

671. The Environmental Health and Sanitation Directorate will coordinate all implementation monitoring and evaluation. The on-going programme of strengthening the EHSD and its regional level offices shall be deepened. While the EHSD has attained the status of a line directorate within the Ministry, it is envisaged that it would evolve into a department under the Local Government Service.

672. The Regional Environmental Health and Santitation Directorates shall be provided with the necessary logistics to support the Results-Based M & E of the NESSAP programmes.

At the Regional level, the relevant agencies will provide the required collaborative support and backstopping to the REHSD. The regional level agencies are

- Regional Planning Coordinating Unit (RPCU)
- Regional Environmental Protection Agency (EPA)
- Regional Hydrological Services Department (HSD)
- Town and Country Planning Department
- Ghana Health Service (GHS)
- Ghana Education Service (GES)
- Ghana Statistical Service
- CWSA
- Ghana Tourist Board
- Department of Women of the Ministry of Women and Children
- Ghana Water Company

673. Following the top-down bottom-up approach, MMDAs shall implement the relevant NESSAP programmes through their DESSAPs. The DESSAPS shall be integrated into the District Medium-Term Development Plans and provide the basis for the preparation of annual work plans. The Waste Management Departments and the Environmental Health Directorates will be primarily responsible for initiating and implementing all activities as part of their day to day functions.

674. The involvement of regional level institutions and the expanded DPCUs as part of organisational arrangement for supporting MMDAs in the management of baseline data collection and subsequent preparation of DESSAPs has proven to be effective and will therefore be followed in the delivery of implementation packages.

675. The costs of managing "incremental" operations and responsibilities due to implementing the plan are considered as part of the RPMG programme.

676. The critical new institutional issue concerns the establishment of an effective mechanism for overseeing the implementation of the NESSAP and the accompanying SESIP. The options tabled include the following:

- establishment of the National Environmental Sanitation Investment Management Board (NESIMBoD) with clear mandate to oversee arrangements for implementing the NESSAP and how funds allocated from the Consolidated Fund and other sources such as Internally Generated Funds (IGFs) from MMDAs, loans and grants, levies on plastic products and municipal bonds are disbursed;
- operating two-streams of funds under the already established District Assemblies' Common Fund (DACF). One stream of the DACF will be for its traditional infrastructure development projects and the other dedicated to implementing the SESIP.

6.3 Results –Based Monitoring & Evaluation (M & E)

677. Monitoring and Evaluation (M&E) system provides evidence-based answers to the efficiency and effectiveness of the impact of projects on beneficiaries. Monitoring addresses the accountability concerns of stakeholders, gives public sector managers information on progress toward achieving stated targets and goals, and provides substantial evidence for any necessary mid-course corrections in policies, programs, or projects. Evaluation provides the feedback with respect to outcomes and consequences of governmental actions. An effective M&E system is an additional public sector management tool.

678. Results-Based M&E (RB M&E) goes beyond the regular M&E systems. Besides the input and output indicators, the Results Based M & E is concerned with the outcome (behavior change) and impact (effects) as well. NESSAP has adopted the RB M&E approach for a detailed and effective M&E system.

679. The preparation of DESSAPs which provided inputs to the NESSAP was achieved with active participation of regional-level collaborative institutions. The M&E strategy of NESSAP is built on this established collaborative mechanism. This will involve the RPCU, REHO staff and heads of all partner institutions. They will collate and validate all relevant information on the status of all ongoing NESSAP programs and projects in the regions and submitted on monthly and quarterly basis to the EHSD/MLGRD. A composite analysis would be done by the head office team. This will ensure timely provisions of information and updated statistics on progress at the national level.

680. The EHSD will be supported to develop R-B M&E tools that will enhance its capacity in providing timely information and data on environmental sanitation services. Regional Environmental Health and Sanitation Departments (REHDs) and MMDAs will also benefit by focusing on results that impact on how services can be improved. The development of appropriate software programmes that will capture components of environmental sanitation with the capacity to provide community-by-community profiles of services will further improve provision of data to the annual progress review process of the National Development Planning Commission (NDPC).

681. The NESSAP RB M&E covers activities and targets of the focus areas as detailed in Chapter 4. For each of them, sets of indicators for input/activities, output, outcome and impacts have been set as applicable.

Table 6.6: Indicators for Results-Based M&E for Capacity Development

A. Capacity Development			
Objective/ target			**Indicators**
	Specific Component Measures: Solid Waste Management		
1	A1	Strengthen REHOs to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff	**Impact:** Quality of life improved with a positive balance in the economic importance of solid waste management by 2020
			Outcome: Collection and transport of solid waste by the private sector though franchise has increased form 75% in 2009 to 100% by 2020 Qualified staff available in the sector providing easy access to technical advise and support services by 2025
			Output: the REHOs in the 5 selected MMDAs are strengthened with a set of qualified staff by 2015 School of Hygiene operational as a tertiary institution under the Ministry of Education by 2020 Staff population ratio improved by 20% by 2020
			Input / Activity: i) Appoint appropriate set of staff to MMDAs including Sanitary Engineers, EH Technologists, Planners in the pilot participating Assemblies: Accra, Kumasi Tamale, Sekondi-Takoradi and Cape Coast by 2015 ii) Identify and provide support (technical and financial) to at least 4 private sector operators in each Assembly to develop their capacity in service delivery in solid waste management by 2015 **iii)** Restructure the curriculum, administration and facilities of School of Hygiene towards a tertiary Institution starting from 2010
	Specific Component: Storm Water Drainage and Sullage conveyance		

A. Capacity Development			
Objective/ target			**Indicators**
	Specific Component Measures: Solid Waste Management		
2	A2	Strengthen REHOs to effectively facilitate programmes of MMDAs including the appointment of qualified professional staff	**Impact** Flood prone tendencies reduced by 45% by 2020 thereby improving the safety and quality of life
			Outcome Concrete drains channeling 60% of sullage and storm water into the primary drains b y 2020
			Output: At least 20km of concrete drain constructed per year in each selected MMDA to carry sullage between 2010 and 2020 60% of the population educated on the proper use of drains by 2020
			Input/activities: i) Develop and implement training programme for drainage planning and maintenance management for key staff in all selected MMDAs by 2015 ii) Equip REHOs with the required implements and tools commensurate with the training received **iii)** Educate public on the proper use of drains
		Specific Component : Environmental Sanitation, Educations and Enforcement Management	
3	A3	Support effective implementation of ESICOME and its related progress	Impact Environmental cleanliness becomes lifestyle of residents in the cities.
			Outcome: • Court cases related to sanitation offences reduced from xxx on average per year in 2010 to xyz/year in 2020
			Output: 3 No. Annual training programmes and 2 clean-up campaigns held annually in each city between 2010 and 2020
			Input: i) Implement annual training programme for REHSDs and EHMDs in the selected MMDAs – Accra, Kumasi, Tamale Sekondi-Takoradi and Cape Coast between 2010 – 2015 ii) Implement mass education and school education programme and environmental sanitation
	Specific Component: Health Care, Industrial and Hazardous Waste		
4	A4	Strengthen Regional Environmental Health officers to effectively facilitate programs of MMDAs including the appointment of qualified professional staff by 2009	**Impact** Clinical waste well managed by 2020 and beyond
			Outcome REHOs and health related Officials conscious of health waste hazards and are disposing them effectively by 2015
			Output Health facilities in the implementing cities have one decent and effective facility each in disposing HCF wastes by 2015.
			Input/Activity i) Implement annual training programme for REHSD and EHMDs in MMAs in clinical/hazardous waste management commencing in 2010 ii) Identify sties and facilitate the construction environmentally friendly disposable facilities for clinical waste in each of the MMDAs.

Table 6.7: Indicators for R-B M&E for IEC

B. Focus Area: Information, Education and Communication.			
Objective/ target			**Indicators**
	Specific Component Measures: Solid Waste Management		
1	B1	Promote benefits of alternative uses of waste through reduction, re-use, recycling and recovery	**Impact:** The acceptance and practice of 4Rs impact positively on the economic life of the residents in the cities
			Outcome: • Environmental sanitation day turns a clean-up campaign week in all cities by 2012 Residents sort out solid waste before disposal by 2012
			Output: i) A well organized IEC materials and a one TOT held in each Assembly for sector staff by 2011 ii) 60% Residents in the Assemblies sensitized on the 4Rs by 2020 iii) Appropriate disposal sites identified and acquired by all Assemblies by 2012
			Input/Activity i) Develop IEC materials on the 4Rs of solid waste management by mid 2011 for use by the selected MMDAs ii) Organize TOT workshops on the materials for the sector staff by 2011 iii) Roll out community education programmes on the 4Rs of solid waste management at least 2 times in a year between 2012-2020 **iv)** Train sector staff in the application of SEA tools by 2011
	Specific Component: Excreta Management		
2	B2	Identify, select and use disposal sites using participatory approaches in accordance with SEA principles	Impact Excreta related diseases and health hazards reduced by 70% from 2015
			Outcome Excreta management is in accordance with accepted standards and practices in the Assemblies by 2014
			Output 1 appropriate disposal site identified developed and in use in each Assembly by 2012 No. of staff trained and at post
			Input/Activity i) Develop participatory tools for identification of sites for excreta disposal by mid 2010 **ii)** Train sector staff in the use of the tools by December 2010
		Specific Component: Storm water drainage and sullage conveyance	
3	B3	To restore and improve wetlands and water courses	**Impact** Floods in the cities during rainfall prevented by 2013
			Outcome National consciousness on the value of water courses and wetlands raised; wetlands and water courses well protected; and encroachment reduced by 2012
			Output i) 2 advocacy groups identified and technically equipped in each Assembly to restore wetlands and water courses by 2011 ii) A directory of all wetlands in the Assemblies and those of national interest in their region compiled by 2012
			Input/Activity Identify wetlands advocacy groups /NGOs in each Assembly and provide technical support for their operations by 2011
	Specific Component: Environmental Sanitation Education and Enforcement Management (food hygiene, sanitary inspection, Law enforcement)		
4	B4	Create awareness on good environmental sanitation practices and its economic importance on society.	**Impact** Quality of life improves through appropriate practices of environmental sanitation
			Outcome Street litter reduced by 70% in 2012. Foods vendors conforming to standard hygiene practices in the cities
			Output i) IEC materials distributed in all schools, departments and general public in each Assembly by 2012 ii) A well equipped advocacy groups educating public on hygienic disposal of wastes
			Input/Activity i) Develop and distribute, IEC materials on waste generation by type, volume, source value and impact for each Assembly by 2011 ii) Identify and support advocacy NGOs/CBOs and technically equip them create the awareness of on appropriate environmental sanitation practices by 2011.

Table 6.8: Indicators for R-B M&E for Legislation and Regulation

C.		Focus Area: Legislation and Regulation	
		Objective/ target	**Indicators**
	Specific Component: Solid Waste Management		
1	C1	Create the enabling legal and regulatory environment for institutional functions in the ownership and use of wastes, point and non-point discharges	**Impact** Healthy environment for better economic growth
			Outcome The business community is willing to enter into partnership in the sector
			Output i) An enabling legal framework that guides public private partnerships, financing arrangements, licensing, monitoring, control and ownership produced by 2011 Institutions - public private partnerships, privatized operations has been created in each city to manage solid waste by 2012
			Input/Activity i) Identify the existing gaps in the legal and regulatory framework and prepare the enabling legislation for institutional functioning by 2011 Provide technical support for the creation of public private institution in the sector
	Specific Component: Excreta Management		
2	C2	Identify (enact) the enabling legislation on land acquisition for disposal sites and modalities for compensation	**Impact** Health related hazards from excreta management reduced thus improving the quality of life for the residents in large towns by 2015
			Outcome Disposal sites made available and sites have been created for use by the sector by 2012
			Output Bottlenecks for land acquisition towards treatment and disposal of excreta removed by 2011
			Input i) Enact the required legislation to enable land acquisition for treatment and disposal of excreta by 2011 **ii)** Educate the community on the new law and support them in taking advantage from 2011
		Specific Component: Storm Water Drainage and Sullage Conveyance	
3	C3	To enforce compliance of legislation and bylaws on the use of wetlands and water courses.	**Impact** Healthy environment for better economic growth
			Outcome Wetlands are protected to receive storm drain and floods reduced. Water courses protected for enabling perennial flow of clean water for downstream use
			Output i) Bye-laws on water courses and wetlands understood and appreciated by all by 2012 ii) NGOs and CBOs formed to protect water course and wetlands in common.
			Input/Activity i) Review and publish existing bye-laws on use of wetlands and water course by 2011 ii) Educate public on the economic value of wetlands by 2011 iii) Support the creation of NGOs to advocate for the protection of wetlands
	Specific Component: Environmental Sanitation Education and Enforcement Management (Food Hygiene, Sanitary Inspection law Enforcement)		
4	C4	Strengthen the capacity of the judiciary, law enforcement, agencies and REHOs in dealing with legalities on environmental sanitation and related issues	**Impact** Improved quality of life due to improved environmental sanitation
			Outcome Environmental sanitation offenders reduced by 70% by 2012 as a result of compliance and enforcement of values and regulations
			Output i) Judiciary abreast with effects of environmental sanitation in all cities by 2011 ii) REHOs strengthened to prosecute offenders in court by 2011 iii) Voluntary compliance of environmental sanitation laws and regulations
			Input/Activity i) Organize seminars on effects of poor environmental sanitation on human health for each Assembly by 2011. ii) Train REHOs in prosecuting environmental sanitation offenders in the courts by 2011 organise mass education – radio, TV on behavior change on environmental sanitation for residents in 2011i

Table 6.9: Indicators for Results-Based M&E for Sustainable Financing and Cost Recovery

D.	Focus Area: Sustainable Financing and Cost Recovery		
	Objective/ target		**Indicators**
	Specific Component: Solid Waste Management (Applicable to all Components)		
1	D1	To operate a full-cost recovery solid waste management facilities	**Impact** Easy access to multiple solid waste management facilities creates healthy environment for higher quality of life for economic growth
			Outcome Well maintained facilities with project life span assured
			Output i) Common understanding on use of and payment for facilities ii) Sufficient funding to maintain and expand facilities available by 2012
			Input/Activity i) Educate residents on need for sustainability of facilities by 2011 ii) Set up differential tariffs using participatory approaches to ensure general compliance by 2011 iii) Design and create bylaws on sustainable use of facilities by 2011

Table 6.10: Indicators for Results-Based M&E for Levels of Service

E.	Focus Area: Levels of Service		
	Objective/ target		**Indicators**
	Specific Component: Solid Waste and Excreta Management		
1	E1	Promote private sector participation according to prescribed safety, access and healthy standards	**Impact** Improved quality of life as solid waste and excreta are well managed
			Outcome Smooth operation of solid waste and excreta management according to rules and standards of engagement by 2012
			Output i) Rules of engagement made clear to all private participants ii) Interested operators identified, registered and assigned by 2011 Primary separation of solid waster targeted at 20% by 2013
			Input/Activity i) Publish the prescribed standards and levels of service and circulate to all private sector participants by 2011 ii) Identify, publish and distribute required targeted services in environmentally sensitive areas such as water course and wetlands by 2011 Identify, organise and agree with private operators the modalities for participating in service delivery
2		Create jobs in response to 4Rs and MINT	**Impact** Increased livelihoods from "green" collar jobs
			Outcome Increase in number of generators (e.g. households, offices, restaurants etc) practicing source separation of MINT Reduction in waste volumes for landfilling
			Output (i) Enterprises established annually (ii) MRFs established per district (iii) Green collar jobs created annually
			Input/Activity (i) Analyse value chains for job creation opportunities (ii) Promote establishment of potential enterprises within the value chains

ANNEXES

Annex 1: Summary of Consultations - (National/Region Workshops, FGDs and KPIs)

Phase 1 -Preparatory and Start-up			
Institution/Event	**Persons Met**	**Role/Designation**	**Date**
MLGRD/EHSD	Daniel Nyankamawu Naa Demedeme	Chief Director Director, EHSD	18-06-2007
Royal Netherlands Embassy	Ms. Wilma van Esch	First Secretary, Environment and Water	18-06 -2007
MLGRD-Projects Coordinating Unit (PCU)	Kofi Howard Cornelius Adablah Bo Sandaren	Ag. Technical Director Deputy Manager, IFAB/UESP II-Institutional Strengthening Solid Waste Management Specialist, IFAB/UESP II-Institutional Strengthening	19-06-2007
Environmental Protection Agency	Daniel Anku	Director, Network	20-06-2007
	Charles Asare	Director, Built Environment	
National Development Planning Commission	Jonathan Azazoo	Snr. Planning Analyst	20-06-2007
	Dr. Mensah Bonsu Jonathan Azazoo Kwaku Agyei-Fosu Nelson	Director Planning Snr. Planning Analyst Principal Planning Officer	
Royal Danish Embassy	Lars Moller Larsen	Water Sector Coordinator	20-06-2007
NESPoCC Meeting	Expanded Membership		21-06-2007
1st- Round Regional Consultations	10 Regional Environmental Health Officers & Selected staff, and WMDs of KMA/TAMA	Volta, Eastern, Greater Accra	21/24-08-2007
		Northern, Upper East, Upper West, Brong Ahafo, Ashanti	04/08-09-2007
Phase 2 – Field Data Gathering and Preparation of Interim NESSAP			
Special NESPoCC Meeting	Expanded Membership/ DPs and Sector Stakeholders,	Coconut Grove Regency	11 – 09 – 2007
4th Quarterly Meeting NESPoCc	Expanded Membership	MLGRD Conference Room	23 -10 – 2007
Regional Consultative Workshops	10 Regions, RCCs, Regional level Agencies, District Environmental Health Officers and District Planning Officers	10 Regional Capitals	5-11-2007 to 5 -12-2007
2nd Regional Roundtable Meetings	10 Regional Environmental Health Units & Regional-level collaborative Agencies		5–14/2-2008
Phase 3 – Baseline Data Validation and Preparation of Final NESSAP			
3rd Regional Roundtable Meetings	10 Regional Environmental Health Units & Regional-level collaborative Agencies		Mar 11-19, 2009

Phase 1 -Preparatory and Start-up			
Institution/Event	**Persons Met**	**Role/Designation**	**Date**
Regional Validation Workshops	10 Regions, RCCs, Regional level Agencies, District Environmental Health Officers and District Planning Officers	10 Regional Capitals	25-03-2009 to 24 -04-2009
Internal Progress Review Meetings	EHSD & WasteCare Staff, Sector Advisor & External Consultants	Afia Hotel/WasteCare Trade Fair	12-15 Aug. 2009; 28 Sept -7th Oct. 2009;
Quarterly Meeting NESPoCc	Expanded Membership	MLGRD Conference Room	Nov. 10, 2009
Quarterly Meeting NESPoCc	Expanded Membership	Coconut Grove regency	Apr 8, 2010

Annex 2: Data Tables

Regional & District Profiles – Environmental Sanitation Services

(Community-by-community data is presented in a separated Appendix to the NESSAP)

Table A2.1: National Profile – Environmental Sanitation Services

NATIONAL SUMMARY

FieldName	Number
*ACEHO	92
*AEHT	44
Approved Industrial Refuse Dumps	81
Approved Public Refuse Dumps	33,795
Approved School Refuse Dumps	5,980
Boreholes	21,392
Communal Container Site	60
Communities That Bury Waste	4
Communities With Communal Waste Containers	717
Communities With Controlled Dumps	149
Communities With Crude Dumps	410
Communities With House To House Waste Collection Service	1
Communities With Other Waste Disposal Methods	66
Controlled Dumping Sites	27
Crude Dumping Sites	31,313
Ditch (m)	1,069,676
Drinking Premises	96,257
Dug-Out	10,839
Eating Premises	53,311
*EHA	860
*EHO	218
EHT	116
Gutter (m)	1,565,260
Hand-Dug Wells	68,593
Hygienic Meat Shops	1,421
Industrial KVIP Latrines	1,118
Industrial Pan Latrines	37
Industrial Pit Latrines	1,479
Industrial Premises	30,073
Industrial Septic Tank Latrines	127
IndustrialVIPLatrines	648
Industrial WC Latrines	10,560
Inside BathHouse	1,745,331
Other Industrial Latrines	303
Other Premises	31,007
Other Private Latrines	28,641
Other Public Latrines	2,234
Other Refuse Disposal Sites	16,797
Other School Latrines	2,012
Outside BathHouse	731,519
*PEHA	884
*PEHO	117
PipeBorne	239,756
Ponds	3,521
Population	21,452,903
Private KVIP Latrines	56,062
Private Pan Latrines	15,271
Private Pit Latrines	113,465
Private Septic Tank Latrines	6,133
Private VIP Latrines	148,361

NATIONAL SUMMARY	
FieldName	**Number**
Private WC Latrines	311,844
Public BathHouses	29,355
Public KVIP Latrines	4,337
Public Pan Latrines	790
Public Pit Latrines	12,273
Public Septic Tank Latrines	3,080
Public VIP Latrines	1,576
Public WC Latrines	3,347
Refuse Burning Sites	14,706
Refuse Disposal House To House	2
Refuse Disposal Sites	783
Residential Premises	2,883,133
Rivers	3,385
School KVIP Latrines	8,193
SchoolPanLatrines	294
School Pit Latrines	2,932
School Premises	29,203
School Septic Tank Latrines	684
School VIP Latrines	4,335
School WC Latrines	10,674
*SEHA	797
*SEHO	149
Sewer	159,929
Shared BathHouse	177,139
Slaughter Houses	146
Slaughter Stabs	254
Soakage Pits (No)	301,810
Springs	1,284
Streams	7,224
Unapproved Industrial Refuse Dumps	4,492
Unapproved Public Refuse Dumps	21,261
Unapproved School Refuse Dumps	10,939
Unhygienic Meat Shops	802
Unskilled Labour Available	7,662
Unskilled Labour Needed	11,909
Vacant Lots	500,067

*ACEHO- Assistant Chief Environmental Health Officer

*AEHT- Assistant Environmental Health Technologist

*EHA- Environmental Health Assistant

*EHO- Environmental Health Officer

*EHT- Environmental Health Technologist

*PEHA- Principal Environmental Health Assistant

*PEHO- Principal Environmental Health Officer

*SEHA- Senior Environmental Health Assistant

*SEHO- Senior Environmental Health Officer

Table A2.2: Regional Profile – Environmental Sanitation Services

REGIONAL SUMMARY

FieldName	ASHANTI	BRONG AHAFO	CENTRAL	EASTERN	GREATER ACCRA	NORTHERN	UPPER EAST	UPPER WEST	VOLTA	WESTERN
ACEHO	7	15	3	13	23	15	3	3	4	6
AEHT	11	7	0	3	8	3	0	0	3	9
Approved Industrial Refuse Dumps	15	4	24	8	14	13	2		1	
Approved Public Refuse Dumps	6,971	2,372	1,342	2,317	2,222	5,439	105	227	1,073	11,727
Approved School Refuse Dumps	904	942	906	691	937	279	100	204	637	380
Boreholes	3,413	2,772	1,501	2,168	992	3,449	1,782	1,865	1,771	1,679
Communal Container Site	33	4	7		5			11		
Communities That Bury Waste					4					
Communities With Communal Waste Containers	41	36	9	50	22	50	136	356	16	1
Communities With Controlled Dumps	12		3			0	0	134		
Communities With Crude Dumps	12		4	2			93	299		
Communities With House To House Waste Collection Service						1		0		
Communities With Other Waste Disposal Methods	12	6			4		11	33		
Controlled Dumping Sites			8	1		18			0	
Crude Dumping Sites	699	159	277	2,084	2,870	9,308	8,799	7,117	0	
Ditch (m)	182,943	65,394	118,403	391,403	96,430	26,072	103	2,058	98,320	88,548
Drinking Premises	10,643	10,200	7,356	12,145	17,308	3,566	7,215	9,101	10,629	8,094
Dug-Out	4,489	134	310	388	2,154	1,575	262	170	563	794
Eating Premises	7,620	7,285	3,911	5,177	12,708	2,318	2,975	880	6,430	4,007
EHA	101	114	45	63	86	186	92	34	50	89
EHO	28	14	19	25	40	33	18	7	16	18
EHT	14	5	8	5	14	35	2	1	4	28
Gutter (m)	251,290	65,516	77,775	359,160	105,092	52,152	3,635	8,501	71,964	570,172
Hand-Dug Wells	16,200	7,875	2,590	8,796	1,624	9,523	3,218	769	13,030	4,968
Hygienic Meat Shops	149	186	247	66	619	43	26	7	50	28
Industrial KVIP Latrines	104	37	53	17	771	15	6	1	75	39
Industrial Pan Latrines	1	0	0	7	18	0	0	0	11	0
Industrial Pit Latrines	245	218	123	115	73	2	0	0	43	660
Industrial Premises	6,605	1,512	3,150	2,134	5,250	2,278	2,138	611	5,257	1,138
Industrial Septic Tank Latrines	6	1	1	6	4	0	0	0	104	5
IndustrialVIPLatrines	116	130	74	31	190	19	15	3	42	28

REGIONAL SUMMARY

FieldName	ASHANTI	BRONG AHAFO	CENTRAL	EASTERN	GREATER ACCRA	NORTHERN	UPPER EAST	UPPER WEST	VOLTA	WESTERN
Industrial WC Latrines	874	214	440	179	7,881	35	74	0	400	463
Inside BathHouse	254,344	303,319	68,237	114,782	246,180	389,858	140,870	65,216	97,342	65,183
Other Industrial Latrines	38	1	3	8	190	0	51	0	9	3
Other Premises	3,844	969	2,701	2,080	9,123	1,713	129	872	1,810	7,766
Other Private Latrines	2,336	235	770	497	19,162	198	31	1,763	1,048	2,601
Other Public Latrines	121	1,427	286	44	46	18	2	1	201	88
Other Refuse Disposal Sites	509		24	57	4,422	313	7,727	3,745		
Other School Latrines	65	1,788	6	12	62	13	8	7	26	25
Outside BathHouse	82,930	113,941	73,535	117,398	100,190	24,370	3,043	12,977	132,235	70,900
PEHA	100	77	86	124	153	83	83	31	78	69
PEHO	10	16	18	16	25	1	4	0	17	10
PipeBorne	17,334	3,399	10,443	12,344	171,688	1,294	847	1,288	8,635	12,484
Ponds	89	134	203	248	1,515	451	69	340	393	79
Population	4,697,694	1,845,019	1,404,922	3,642,257	2,957,827	2,243,987	788,338	599,267	1,353,659	1,919,933
Private KVIP Latrines	5,705	3,466	5,825	5,879	21,817	2,577	257	632	7,934	1,970
Private Pan Latrines	1,573	328	828	2,241	6,514	1,013	139	26	2,059	550
Private Pit Latrines	10,336	9,257	12,839	33,549	15,852	841	38	345	9,879	20,529
Private Septic Tank Latrines	555	1,553	390	403	1,688	282	105	15	631	511
Private VIP Latrines	24,014	24,244	14,004	25,707	20,610	12,562	2,479	6,554	9,760	8,427
Private WC Latrines	43,098	11,729	16,887	20,555	182,821	3,025	1,591	2,091	10,141	19,906
Public BathHouses	1,868	69	551	8	23,341	551	1,357	52	317	1,241
Public KVIP Latrines	728	358	448	453	690	463	177	239	449	332
Public Pan Latrines	79	14	49	52	272	35	13	0	244	32
Public Pit Latrines	2,169	2,922	1,554	1,683	259	38	8	3	2,312	1,325
Public Septic Tank Latrines	505	335	241	430	618	274	83	61	234	299
Public VIP Latrines	299	120	230	269	150	193	51	15	97	152
Public WC Latrines	350	96	169	195	2,078	47	16	82	163	151
Refuse Burning Sites	15				48	1,008	11,507	2,128		
Refuse Disposal House To House				2						
Refuse Disposal Sites	106				23	177	47	430		
Residential Premises	346,644	598,094	314,706	302,046	305,241	270,623	92,648	78,937	285,029	289,165
Rivers	201	406	211	1,138	27	555	117	138	342	250
School KVIP Latrines	1,026	825	766	842	1,623	981	288	340	1,128	374
SchoolPanLatrines	15	15	21	17	194	0	1	0	11	20

REGIONAL SUMMARY

FieldName	ASHANTI	BRONG AHAFO	CENTRAL	EASTERN	GREATER ACCRA	NORTHERN	UPPER EAST	UPPER WEST	VOLTA	WESTERN
School Pit Latrines	461	682	556	301	234	21	2	2	193	480
School Premises	3,928	3,102	2,522	2,915	7,000	2,577	1,321	1,193	2,476	2,169
School Septic Tank Latrines	167	50	15	223	31	52	30	1	57	58
School VIP Latrines	819	475	524	646	947	404	59	88	222	151
School WC Latrines	919	528	367	389	5,833	111	514	253	1,194	566
SEHA	67	121	52	114	110	152	51	20	67	43
SEHO	17	43	5	22	30	10	7	0	6	9
Sewer	17,707	1,497	522	10,016	20,729	875	1,390	7	43,881	63,305
Shared BathHouse	23,809	28,647	21,368	26,675	19,091	2,091	15	1,102	17,779	36,562
Slaughter Houses	13	17	4	18	13	33	8	9	24	7
Slaughter Stabs	32	39	7	18	13	49	18	26	35	17
Soakage Pits (No)	35,771	40,217	14,071	39,235	50,349	37,791	3,098	7,836	54,881	18,560
Springs	194	145	34	650	57	89	16	6	42	51
Streams	903	989	699	957	52	1,401	233	411	610	969
Unapproved Industrial Refuse Dumps	275	371	332	589	893	458	5	19	1,353	197
Unapproved Public Refuse Dumps	277	332	523	900	43	16,612	1,447	771	63	293
Unapproved School Refuse Dumps	1,008	1,648	1,367	1,772	871	1,169	243	599	1,139	1,123
Unhygienic Meat Shops	91	185	112	45	149	82	12	32	78	16
Unskilled Labour Available	606	1,242	1,042	483	3,027	245	168	78	278	493
Unskilled Labour Needed	768	1,308	2,192	1,109	2,054	1,777	397	227	972	1,105
Vacant Lots	76,806	64,827	31,038	67,085	25,456	58,571	24,344	32,001	49,454	70,485

Table A2.3: Population of Metropolitan, Municipal and Districts Assemblies (submitted by RPCUs and Regional Statisticians)

REGION: ASHANTI		
No.	MMDA	POPULATION (2008)
1.0	Kumasi Metropolitan	
1.1	Asawasi Sub Metro	198,933
1.2	Asokwa Sub Metro	332,969
1.3	Bantama Sub Metro	266,937
1.4	Kwadaso Sub Metro	363,730
1.5	Manhyia Sub Metro	275,766
1.6	Nhyiaeso Sub Metro	188,017
1.7	Oforikrom Sub Metro	226,303
1.8	Suame Sub Metro	306,610
1.9	Subin Sub Metro	132,546
1.10	Tafo Sub Metro	265,953
2	Obuasi Municipal	221,154
3	Mampong Municipal	88,625
4	Bekwai Municipal	130,452
5	Offinso Municipal	67,346
6	Asante Akim North Mun.	158,432
7	Ejisu-Juaben Municipal	24,120
8	Adansi North	92,834
9	Adansi South	122,811
10	Ahafo Ano North	97,213
11	Ahafo Ano South	175,889
12	Amansie Central	81,871
13	Amansie West	163,260
14	Asante Akim South	118,869
15	Atwima Mponua	136,487
16	Atwima Nwabiagya	168,804
17	Bosomtwe	93,498
18	EjuraSekyedumase	85,393
19	Kwabre	141,690
20	Sekyere East	77,614
21	Sekyere South	106,351
22	Afigya Kwabre	89,967
23	Atwima Kwanwoma	97,312
24	Bosome Freho	388,636
25	Offinso North	76,623
26	Sekyere Afram Plains	92,857
27	Sekyere Central	88,924
	TOTAL	5,744,796

REGION: BRONG AHAFO		
No.	MMDA	POPULATION (2008)
1	Asunafo North	130,511
2	Asutifi	103,630
3	Tano North	72,633
4	Sunyani	219,764
5	Dormaa	184,357
6	Jaman North	101,840
7	Berekum	114,362
8	Wenchi	97,086
9	Techiman	214,165
10	Nkoranza	158,183
11	Kintampo North	93,526
12	Atebubu	80,040
13	Sene	100,785
14	Asunafo South	82,949
15	Jaman South	80,098
16	Tain	107,316
17	Kintampo South	86,502
18	Pru	120,302
19	Tano South	78,734
20	Dormaa East	27,487*
21	Nkoranza North	42,835*
22	Sunyani West	88,279*
	TOTAL	2,226,783

*Figures collated from DESSAP Survey, 2009

REGION: CENTRAL		
No.	MMDA	POPULATION (2008)
1	Cape Coast Metro.	118,106
2	Komenda Edina Eguafo Abirem	112,435
3	Twifo Hemang Lower Denkyira	110,350
4	Upper Denkyira East Mun.	91,050
5	Upper Denkyira West Dist.	54,000
6	Abura Asebu Kwamankese	105,305
7	Assin South	128,165
8	Assin North	116,349
9	Mfantseman Mun.	152,264
10	Ajumako Enyan Essiam	111,765
11	Asikuma Odoben Brakwa	112,512
12	Gomoa East	124,824
13	Gomoa West	109,207
14	Agona East	65,000
15	Agona West	113,000
16	Effutu Mun.	63,792
17	Awutu Senya	150,000
	TOTAL	1,838,124

REGION: EASTERN				
No.	MMDA	POPULATION		
		2007	2008	2009
1	Akwapim North	115,822	117,076	118,716
2	Akwapim South	128,236	130,031	131,852
3	Asuogyaman	83,680	84,852	86,039
4	Akyemansa	-	56,321	57,109
5	Atiwa	99,658	101,053	102,468
6	Birim Central	159,810	132,295	134,147
7	Birim North	136,081	81,686	82,809
8	Birim South	-	86,144	87,350
9	East Akim	110,145	111,687	113,251
10	Fanteakwa	94,960	96,289	97,637
11	Kwaebibirem	197,527	200,292	203,096
12	Kwahu East	-	75,903	76,966
13	Kwahu North	149,822	151,920	154,046
14	Kwahu South	159,810	86,144	87,350
15	Kwahu West	79,905	81,024	82,158
16	Lower Manya Krobo	170,073	82,758	83,917
17	New Juaben	150,748	152,858	154,998
18	Suhum Kraboa Coaltar	183,488	186,057	188,682
19	Upper Manya Krobo	-	89,696	90,952
20	West Akim	169,918	172,297	174,709
21	Yilo Krobo	94,838	96,166	97,512
	TOTAL	2,322,030	2,354,538	2,387,502

REGION: GREATER ACCRA		
No.	MMDA	POPULATION
1	Tema Metropolitant Assembly	551,459
2	Ledzekuk-Krowor Municipal Assembly	300,000
3	Adenta Municipal Assembly	76,239
4	Ga South Municipal Assembly	210,727
5	Ashaiman Municipal Assembly	217,717
6	Damgbe West District Assembly	96,909
7	Damgbe East District Assembly	93,112
8	Ga East Municipal Assembly	241,752
9	Ga West Municipal Assembly	277,969
10	Ablekuma Central Sub Metro	192,759
11	Ablekuma North Sub Metro	280,147
12	Ayawaso West Sub Metro	37,731
13	La Sub Metro	100,962
14	Osu Klottey Sub Metro	124,060
15	Okaikoi South Sub Metro	54,355
16	Ablekuma South Sub Metro	275,000
17	Ayawaso Central Sub Metro	153,629
18	Ashiedu Keteke Sub Metro	88,717
19	Ayawaso East Sub Metro	223,191
20	OKAIKOI NORTH SUB METRO	294,580
	TOTAL	3,891,015

REGION: NORTHERN		
No.	MMDA	POPULATION (2009)
1	Bole	79,961
2	Bukpurugu/Yunyoo	99,959
3	Chereponi	63,758
4	Central Gonja	110,100
5	East Gonja	117,369
6	East Mamprusi	124,449
7	Gushegu	80,578
8	Karaga	77,299
9	Kpandai	124,293
10	Nanumba North	102,617
11	Nanumba South	74,783
12	Saboba	72,281
13	Savelugu/Nanton	127,589
14	Sawla/Tuna/Kalba	93,040
15	Tamale Metropolitan	226,569
16	Tolon/Kumbungu	249,681
17	West Gonja	90,032
18	West Mamprusi	159,116
19	Yendi Municipal	177,807
20	Zabzugu/Tatale	119,856
	Total	2,371,137

REGION: UPPER EAST		
No.	MMDA	POPULATION
1	Bawku Municipal	212,557
2	Bolgatanga Municipal	152,658
3	Bawku West	88,946
4	Bongo	83,944
5	Builsa	83,174
6	Garu/Tempane	127,520
7	Kassena/Nankana East	81,159
8	Kassena/Nankana West	85,634
9	Talensi Nabdam	99,833
	TOTAL	1,015,425

REGION : UPPER WEST		
No.	MMDA	POPULATION
1	Wa	116,229
2	Jirapa	63,554
3	Lambussie	49,148
4	Lawra	101,864
5	Nadowli	96,267
6	Sissala East	52,662
7	Sissala West	46,778
8	Wa East	80,900
9	Wa West	63,645
	TOTAL	671,047

REGION: VOLTA		
No.	MMDA	POPULATION
1	Akatsi	110,732
2	South Tongu	76,774
3	Keta	158,333
4	North Tongu	154,456
5	Adaklu Anyingbe	62,696
6	South Dayi	58,657
7	Hohoe	181,298
8	Ho	169,815
9	Kpando	75,155
10	Jasikan	64,341
11	Ketu North	76,356
12	Krachi West	99,939
13	Kadjebi	61,596
14	Krachi East	89,506
15	Ketu South	204,701
16	Nkwanta South	78,939
17	Nkwanta North	76,857
18	Biakoye	83,762
	TOTAL	1,883,913

REGION: WESTERN			
No.	MMDA	POPULATION	
		2000	2009
1	Jomoro	104,393	139,235
2	Mpohor Wassa East	103,500	138,044
3	Ahanta West	95,140	126,894
4	Sefwi Wiawso	145,119	217,577
5	Bia	154,925	210,917
6	Aowin-Suaman	119,133	151,414
7	Wassa Amenfi West	186,257	248,422
8	Wassa Amenfi East	115,092	149,416
9	Sekondi-Takoradi Metro*	369,166	505,853
10	Bibiani-Anhwiaso-Bekwai	103,256	137,718
11	Juaboso	245,035	335,761
12	Nzema East Municipal	142,871	182,170
13	Prestea-Huni Valley	130,000	168,770
14	Shama	88,314	121,013
15	Tarkwa Nsuaem	153,437	199,243
16	Ellembelle	114,839	147,913
17	Sefwi Akontombra	67,028	149,383
	TOTAL	2,439,505	3,331,752

*Comprises: Sekondi, Takoradi, Esikado-Ketan and Efia-Kwesimintsim Sub Metropolitan Assemblies.

Annex 3: Top Six (6) Outpatient Morbidity by Region (2005-2007)

No.	DISEASE	WR	CR	GAR	VR	ER	ASH	BAR	NR	UER	UWR	TOTAL
2005												
1	Malaria	393,008	154,103	472,146	301,246	393,598	800,698	595,992	301,489	276,786	110,092	**3,799,158**
2	Acute Respiratory Infection	60,046	29,676	105,059	46,728	60,290	100,253	84,640	38,798	41,649	14,184	**581,323**
3	Dirrhoeal Diseases	30,738	16,278	48,958	23,263	38,655	75,058	51,461	42,127	20,460	5,386	**352,384**
4	Skin Deseases & Ulcers	27,336	21,748	68,999	28,717	37,706	63,003	46,421	23,751	19,878	14,736	**352,295**
5	Hypertension	18,516	9,603	68,305	31,882	37,300	44,622	22,783	8,323	4,510	3,498	**249,342**
6	Home/Occupational Accidents	15,933	6,010	30,259	14,190	35,677	43,302	32,755	8,659	2,090	3,158	**192,033**
2006												
1	Malaria	480,553	262,517	443,061	224,987	234,869	856,301	730,879	274,019	237,114	117,048	**3,861,348**
2	Acute Respiratory Infection	72,347	45,749	100,299	40,116	45,399	133,840	115,024	30,749	35,033	14,199	**632,755**
3	Diarrhoeal Disease	38,584	32,004	35,499	20,271	20,772	91,117	49,684	36,430	15,930	5,163	**345,454**
4	Skin Deseases & Ulcers	33,091	17,371	59,789	20,704	23,112	76,752	62,476	18,783	17,878	11,088	**341,044**
5	Hypertension	25,543	18,301	70,536	20,413	35,774	57,178	36,489	10,428	5,168	3,761	**283,591**
6	Acute Eye Infection	21,117	9,810	38,382	9,203	24,013	25,126	40,957	6,039	11,265	7,072	**192,984**
2007												
1	Malaria	443807	621476	594834	236074	802940	693884	862309	382990	319174	312620	**5,270,108**
2	Other ARI (Acute)	68608	124733	143648	42598	117852	26319	16813	45759	48226	45254	**679590**
3	Skin Diseases & Ulcers	32819	74465	111053	20709	85727	53845	74170	25212	26513	34684	**539197**
4	Hypertension	22570	57700	110003	34474	157189	44300	45567	13781	6933	12663	**505180**
5	Diarrhoea Diseases	38197	72445	52090	19365	69066	56479	66572	39980	21833	16223	**452250**
6	Acute Eye infection	130197	23999	54372	9905	81722	17848	43538	7646	16893	19959	**288908**

Source: Community Health Improvement Services (CHIPS) - National Centre K'Bu, GHS.

Annex 4: Table of Unit Costs

Eco-toilets including locally designed and built biological toilet are above ground solutions for areas with high water table. The treated excreta serves as humus for soil conditioning. Urine diversion options have great potential for re-use in agriculture. Large scale construction will create thousands of jobs.

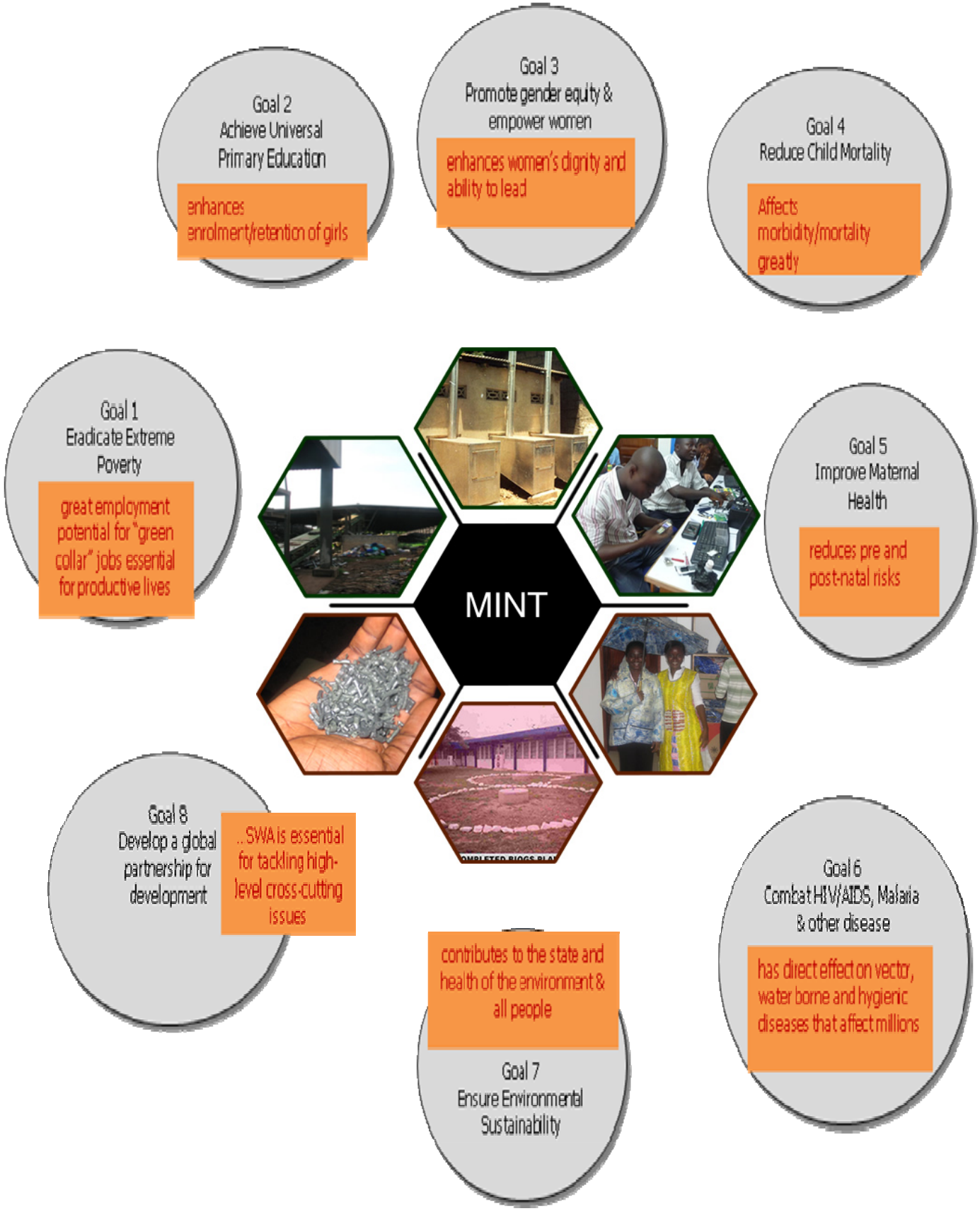
Repair of hand-held phones and 2nd-hand computers have great potential for creating jobs. Getting funds from *end-of-life* payments by primary purchasers of electrical-and-electronic gadgets in advanced economies can cushion handling of WEEE.

Raincoats, jackets, umbrellas and fashion hand-bags from re-used thin-film plastics show the potential for reducing littering through plastic buy-back centres and creating jobs.

Recovery of methane gas for heating and compost from *biogas* plants have potential for contributing to addressing climate change effects and creating jobs for construction gangs.

Pellets from recycled thin-film plastics and products from recycled rubber provide source employment via micro- and small enterprises.

Construction of medium-to-large scale compost plants can provide alternatives and reduce volumes of waste to landfill and provide jobs, and link to urban agriculture. MINT recommends the development of Material Recovery Facilities (MRFs).


Goal 2
Achieve Universal Primary Education
enhances enrolment/retention of girls
Goal 3
Promote gender equity & empower women
enhances women's dignity and ability to lead
Goal 4
Reduce Child Mortality
Affects morbidity/mortality greatly
Goal 1
Eradicate Extreme Poverty
great employment potential for "green collar" jobs essential for productive lives
MINT
Goal 5
Improve Maternal Health
reduces pre and post-natal risks
Goal 8
Develop a global partnership for development
..SWA is essential for tackling high-level cross-cutting issues
Goal 6
Combat HIV/AIDS, Malaria & other disease
has direct effect on vector, water borne and hygienic diseases that affect millions
contributes to the state and health of the environment & all people
Goal 7
Ensure Environmental Sustainability